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# China Report

AGRICULTURE

No. 240

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30 November 1982

CHINA REPORT  
AGRICULTURE

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PEOPLE'S REPUBLIC OF CHINA

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## I. GENERAL INFORMATION

### BUMPER EARLY RICE CROP REPORTED

Beijing ZHONGGUO NONGMIN BAO in Chinese 26 Sep 82 p 1

[Article: "Early Rice State Purchase Quotas Overfulfilled Throughout the Country. In Some Prefectures Have Appeared a Group of Households That Have Sold the State 10,000 Jin of Early Rice From a Single Crop, Production Teams That Have Fulfilled Their Total Annual Purchase Quota in a Single Season, and Production Brigades That Have Sold 1 Million Jin of Early Rice to the State in a Single Season"]

[Text] According to statistics as of 20 September from 10 early rice producing provinces and regions, early rice now stored in granaries overfulfills state procurement plans by 107.2 percent. As compared with the same period last year, speed has been faster, quality of grain in storage is better, and quotas were fulfilled 5 days earlier. The provinces and regions of Guangdong, Guangxi, Fujian, Jiangxi, Hunan, Hubei, and Zhejiang overfulfilled purchase quotas. Statistics as of 15 September show that in Hunan and Guangxi 1.1 billion jin more of early paddy (converted to husked rice terms) has been placed in storage than during the same period last year. Fujian Province overfulfilled early rice procurement quota by 22.3 percent, and Hubei by 20 percent. In Jingzhou Prefecture, Hubei Province, 397 commune member households sold the state 10,000 jin of early rice in a single season; and 4,415 production teams completed their purchase quotas for the entire year in a single season. Eight production brigades in Chuandian Commune in Jiangling County sold to the state more than 1 million jin of early rice in a single season.

This year the early rice in some prefectures sustained serious damage from the elements and cadres and commune members, working under the guidance of CPC committees and the People's Government at all levels, actively joined the struggle against disaster. They intensified late stage field care, reduced losses from disasters, and brought in a bumper early rice crop. Following the bumper harvest, acting on the principal of concurrent concern for the interests of the country, the collective, and individuals, the People's Government everywhere distributed state purchase quotas equitably. In reaping a bumper harvest, the broad masses of peasants did not forget the loving care shown by the party and the support provided

by the country, and they used real actions to hail the victorious opening of the 12th Party Central Committee for a heartening situation of greater sales of surplus grain for greater contributions.

Everywhere business, supply and marketing, industrial and commercial administration, railway, communication and transportation departments actively worked together to make possible quick movement into storage of the early rice. Grain departments actively solved difficulties in selling grain and receiving grain. They used methods that provided convenience to the masses such as numerous individual households selling their grain directly for a preliminary change in the past passive situation.

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## CONTAMINATION OF GRAIN IN TRANSIT WORSENS

Zhanjiang Port Major Offender

Beijing RENMIN RIBAO in Chinese 21 Sep 82 p 2

[Article by Transportation Management Department, Grain Storage and Transportation Bureau, Ministry of Commerce]

[Text] Recent grain shipments into Yunnan, Guizhou, and Guangxi have been seriously contaminated while being transported by railroad, and some shipments have been inedible.

In May this year, the Kunming Municipal Xishan Grain Transfer Station received 81 carloads of corn and wheat from Zhanjiang Port that had been shipped in cars 40 percent of which had not been swept out. On the floors of most cars were coal cinders and coal dust. On 17 May, the Guiyang Municipal Oil and Grain Storage and Transportation Company received a carload of wheat from Zhajiang in a car in which coal dust was 1 to 2 centimeters deep. Not only had the storage bags been blackened, but 158 jin of wheat spread inside the car had become black wheat. In cars containing a wheat shipment from Zhanjiang received by the Nanning Municipal Wheat Flour Mill there was quite a lot of coal ashes and gravel. Annually anywhere from several hundred to as much as 1,000 jin of grain is contaminated. Between January and June this year, the Zhanjiang Port Grain Transfer Station shipped 6,151 carloads of grain to Yunnan, Guizhou, Guangxi, and Hunan provinces, 5,100 of the cars used being open-top hopper cars, virtually none of which had been swept out. Sweeping of cars should be the responsibility of the unloading unit, but neither the port nor the railroad units care.

Contamination of grain by chemical fertilizer and pesticides is also very serious.

We cannot see the country sustain grain losses with indifference. I call upon the railroad, transportation, and grain sectors to solve the problem of grain contamination in transit with all possible speed.

## Grain Shipment Contamination Analyzed

Beijing RENMIN RIBAO in Chinese 21 Sep 82 p 2

[Text] The problem of grain contamination while being shipped by rail is an old one that has not been solved for many years. Recently, the understanding of the situation that we got from railway departments is far more serious than the situation as we understood it from the Grain Storage and Transportation Bureau of the Ministry of Commerce. The soybeans, rice, wheat, and corn contaminated last year during rail shipment totaled 800 tons. During the first half of this year the amount increased to 1,420 tons. Some grain had urea and animal dung sticking to it, and some of it had a strange taste or had changed color and was inedible.

During the past several years, leadership comrades concerned in the State Council have held several meetings on this subject, and the Ministry of Commerce, the Ministry of Railways, and the Ministry of Transportation all have clear instructions about prevention of grain contamination. Nevertheless, numerous transportation departments and grain loading units have not conscientiously put them into effect.

Comrades in railroad freight transportation departments have said there are four reasons for grain contamination as follows:

One is failure to implement personal responsibility systems. Freight handling units charged with unloading of coal and chemical fertilizer do not sweep out the cars following unloading as regulations require, or when freight cars have been contaminated with strange smells, the railroad station makes no inspection and outgoing grain is loaded on the cars before they have been scrubbed down. Grain departments also frequently do not inspect in the way that regulations require. When they find cars do not meet specification, they neither make arrangements to change cars nor do they sweep them clean. Instead they put some bedding in them and load grain.

Secondly car disinfecting equipment is inadequate. According to regulations, when railroad cars have been contaminated by pesticides or other toxic materials or contain noxious odors, they must be scrubbed down and disinfected before being used. Today only 21 branch bureaus among the country's 60-odd railroad branch bureaus have places for scrubbing and disinfecting cars. Several such as Fengtai, which had disinfecting sites, closed down because of inability to handle polluted water and pollutants.

Third, is inability to assign cars specially to the hauling of toxic materials. According to regulations, special cars are to be used for the transportation of toxic materials, and after they have been used toxic materials cars are to be put in the custody of custody stations. In 1980, the Ministry of Railways assigned 2,000 cars specifically for the hauling of toxic materials, but most of them require major repairs. The number of cars used specifically for the hauling of toxic goods is small, and there is no fixed way of looking after them. When an urgent situation arises, they are still used indiscriminately.

Four, is poor quality of chemical fertilizer and pesticide containers. Nationally produced pesticides and chemical fertilizers are packed either in paper or plastic bags, the quality of which does not meet specifications. This plus "savage loading and unloading" means a very high breakage rate.

Some comrades suppose that the fundamental reason is that both the railroad and affiliated units pay attention only to quantity while ignoring transportation quality.

For many years the problem of grain contamination has received no serious attention. The danger it poses to the people's health cannot be expressed adequately in simple figures. It seems that the time has come for conscientious solution of this problem.

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NATIONAL SOIL FERTILITY TEST CENTER ESTABLISHED

Beijing ZHONGGUO NONGMIN BAO in Chinese 26 Sep 82 p 1

[Article: "China Sets Up Modern Soil Fertility Testing Center"]

[Text] A soil fertility testing center intended to serve national agricultural research and production was recently established in Beijing and has formally begun trial operation.

This testing center, whose structure covers a 5,100 square meter area, has been built on the grounds of the Chinese Academy of Agricultural Sciences' Soil Fertility Institute. It has modern large scale precision instruments and equipment, and uses electronic computer control and automated analysis. It is capable of analyzing and testing 100,000 samples annually in about 500,000 operations. This testing center was designed by using the method of importing foreign technology and principal equipment that was adapted and augmented in accordance with China's circumstances. This method was both suited to China's circumstances and saved a very large amount of funds. The investment required was half what it would have been had all equipment been imported.

This testing center is the first of nine major agricultural research facilities to be built. It is the third agricultural research base built following completion in May this year of the Hubei Provincial Academy of Agricultural Sciences' Testing Center and expansion of the Guangdong Provincial Academy of Agricultural Sciences' Paddy Rice Institute.

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CSO: 4007/27

## USES OF AIRCRAFT IN AGRICULTURE OUTLINED

Beijing RENMIN RIBAO in Chinese 14 Oct 82 p 2

[Article: "Rapid Increase in Volume of China's Agricultural Air Operations"]

[Text] Since the Third Plenary Session of the 11th Party Central Committee, great development of China's agricultural aviation has taken place. A group of new tasks has been successfully undertaken, and year after year production flying hours have overfulfilled plan. During the past 3 years civil aircraft have carried out more than 80 operations in more than 20 of the country's provinces, municipalities, and autonomous regions flying an accumulated more than 80,000 hours. Their farmland area of operations covered more than 70 million mu; aerial afforestation and planting of grass covered a more than 28 million mu area; and more than 15,800 hours of flying was done for forest protection, a forest area of more than 800 million mu being patrolled annually. Number of hours flown for agriculture increased an average 79 percent over 1978, and in both 1980 and 1981 than 28,000 flying hours were logged for an all-time high.

Every year China's agriculture sustains fairly heavy losses as a result of disease, insect pests, weeds, and rodents. During the past 3 years, a 56 million mu area of farmlands, forests, grazing lands, and orchards has been aerially treated to control insects, effectively preventing and controlling damage from several tens of insect species including migratory indigenous locusts, voracious armyworms, destructive pine moths and suddenly occurring snout moth larvae.

During dry seasons, aircraft engaged in rain making for remarkable results in combat against drought to protect seedlings and to reduce danger of forest fires. During the past several years, annually more than 10 aircraft have carried out rain-making operations over 10 provinces, municipalities, and autonomous regions, rain-making sorties amounting to 70 percent of the total number of sorties for operations of all kinds. Rainfall increased by from 20 to 50 percent over an area of about 350,000 to 400,000 kilometers.

Use of aircraft to carry out leaf fertilization of crops and spraying of plant hormones has rapidly increased since 1979. In northeast, north, and east China, this has become a major way in which to increase yields for numerous state owned farms. Annually nearly 100 aircraft are engaged in such operations nationally over an operational area of more than 10 million mu.

Aerial sowing of seeds for afforestation has become a major way of greening remote barren mountains. During the past 3 years, the area sown has increased at an annual 74.6 percent rate over 1978. In addition to the continued large area sown in southwestern and south China, aerial sowing has also spread to south central, east, northwest, and northeast China.

Since 1979, experiments have been conducted in newly launched aerial sowing of pasture grass on barren mountains, barren plains, and grassy slopes in 44 counties (or banners) in 16 provinces, municipalities, and autonomous regions including Hunan, Shaanxi, and Nei Monggol. As of the end of 1981, 50 aircraft had flown a total of more than 1,500 hours to sow more than 1.2 million mu of pasture grass for a full stand rate of about 50 percent.

In the field of aerial forest protection, as a result of the use since 1979 of helicopters to transport fire fighters on air drops to put out fires, and the use of AN-5 transports to carry fire-extinguishing chemicals, the discovery rate for fires and results in extinguishing fires have risen markedly.

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CSO: 4007/14

# SPURT IN FRESHWATER FISH RAISING REPORTED

Beijing ZHONGGUO NONGMIN BAO in Chinese 20 Sep 82 p 1

[Article: "Nation's Freshwater Fish Raising Continues Growth. More Than 540,000 Mu of Commodity Fish Bases Set Up by State; 1.8 Million Commune Member Households Raising Fish"]

[Text] The country's rural raising of freshwater fish continues to grow. Statistics from 18 freshwater fish raising areas nationally show that during the first 8 months of this year, output totaled 568,000 tons, a 35,000 ton increase over the same period last year.

By way of meeting the struggle objective set by the Central Committee Secretariat for national production of between 4 and 5 million tons of freshwater fish by the end of the 1980's, this year all provinces, municipalities, and autonomous regions have effectively strengthened leadership of freshwater fish raising, treating it as a major matter in economic diversification whereby peasants can become prosperous with all possible speed, and solving problems with capital, skills, and food supply for raising fish. Yunnan Province has decided that beginning this year it will annually obligate 5 million yuan to development of freshwater fish raising. The Hunan Provincial CPC Committee has decided to revive and build aquatic products technical promotion stations in the province's 22 hill counties, and to increase personnel from 500 to 1,050. Many places have put into effect a system whereby 1 jin of feed grain is supplied for each jin of fish purchased.

In order to increase the water surfaces utilization rate and raise yields per unit of area, all jurisdictions have vigorously promoted new techniques for raising fish. Raising of fish in mesh cages has become popular and has spread fairly rapidly. Provincial and municipal statistics for June 1981 showed this method used on only 484 mu, but this increased to more than 1,400 mu this year. Quite a few places have promoted use of pellet feed for fish. Last year this was done on 3,100 mu in Shanghai, and the area has doubled this year. Yields have risen from the somewhat more than 400 jin per mu of the past to somewhat more than 1,000 jin, and to a maximum of somewhat more than 4,000 jin. Guizhou, Hunan, Hubei, Sizhuan, Jiangsu, and Guangxi provinces have revived and developed the raising of fish in paddy fields. Last year the paddy field area used for this purpose was 2.2 million mu; this year it has increased by another 200,000 mu.

All jurisdictions have continued to liberalize fishing industry policies and to further designate and clarify water surface use rights so that the country, collectives, and individuals will all benefit. This year's commodity fish bases built by the state that have gone into production cover 548,000 mu. Progress in local building of commodity fish bases has also accelerated everywhere. Raising of fish by commune member families has also grown rapidly. Last year households engaged in the raising of fish numbered 1.3 million nationally, but this year the number has grown to 1.8 million, and in quite a few communes and brigades every household is raising fish.

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GSO: 4007/23



FINAL TESTS OF NEW IMPROVED WINTER WHEAT VARIETY UNDER WAY

Beijing BEIJING RIBAO in Chinese 15 Sep 82 p 3

[Article: "Superior Winter Wheat Variety Jinghua No 1 Successfully Bred in Beijing. Hu Daofen [7579 6670 5358] and Others Work Hard at Breeding Using Haploid Breeding Method. Great Bumper Yield Potential; Fairly Broad Adaptability; Suited to Rapid Promotion From Existing Foundation"]

[Text] Jinghua No 1, the first rather good superior winter wheat variety suitable for production planted that has ever been bred in China or abroad using the haploid breeding method was declared a success following recent evaluation by Chinese experts concerned. This is the fruit of more than 6 years of arduous efforts on the part of assistant researcher Hu Daofen and others at the Crop Institute of the Beijing Municipal Academy of Agricultural Sciences. This year Jinghua No 1 was test planted at 18 experimental sites in Beijing's suburbs, an overwhelming majority of which produced high yields. Among them was the test planting on 3.16 mu at the Nanjanji Production Brigade where yields averaged 1022.4 jin per mu.

The work of breeding Jinghua No 1 began in 1976. Comrades engaged in the breeding used the pollen haploid breeding method. Four wheat varieties that included "Luofulin 18," "5328 - 036," and "Hongliang No 4" were aggregately hybridized, the pollen from the first generation resulting from the hybridization being cultured for successful harvesting of first generation seeds. In 1978, Hu Daofen and the others used the only 54 seeds they had to evaluate the plant line. As a result of their painstaking propagation, Jinghua No 1 increased gradually in numbers and the scope of experiments expanded year by year. In 1981 Jinghua No 1 participated in medium fertility group regional assessment tests of wheat varieties in Beijing where it took first place among 14 varieties in yield, yields averaging 705 jin per mu, 16.9 percent higher than for "Nongda 139." This year it participated in high fertility group regional assessment tests of wheat varieties in Hebei Province, where it produced highest yields, demonstrating this variety's adaptability when grown elsewhere. Not long ago at a national academic conference for exchange of experiences on wheat another culture and its genetic breeding, which was attended by the country's breeding specialists, an evaluation of Jinghua No 1 was made. They acknowledged the overall superiority of Jinghua No 1 variety, its tillering strength, its high spiking rate, the evenness of its spikes, its many blossoms and many grains, the light color of its grain, its strong disease

resistance, its high resistance to powdery mildew, its high resistance to stalk, leaf, and stem rust, the semi-squatness and toughness of plants, its resistance to lodging, as well as its rather strong ability to withstand cold and hot dry winds. The experts agreed that this variety possesses high potential for bumper yields, that its adaptability is rather wide, and that demonstrations should be expanded on the basis of what has already been done, and promotion accelerated.

The successful breeding of Jinghua No 1 not only provides a better superior variety for future winter wheat production in Beijing's suburbs, but also opens a whole new avenue for scientific breeding work. Comrades who had a part in the breeding of Jinghua No 1 believe that as compared with conventional breeding methods, breeding that uses the haploid breeding method is superior in that it can compress the breeding generations, improve selection efficiency, and conserve manpower and land. At the present time this is an advanced breeding method both in China and abroad.

On 7 August municipal departments concerned held a conference that called for a good job in breeding of Jinghua No 1. This fall the city plans to sow 7,000 mu of Jinghua No 1 wheat, and after a large quantity of superior variety seeds have been obtained, it will promote its large scale cultivation in Beijing's suburbs.

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## ECONOMIC EFFICIENCY IN EXPANDED COTTON PRODUCTION

Beijing NONGYE JINGJI WENTI [PROBLEMS IN AGRICULTURAL ECONOMICS] in Chinese  
No 7, 1982 p 3-6]

[Article by Mei Fangquan [2734 2455 2938]: "A Discussion on Building Economic Efficiency in the Huanghai Plains Cotton Growing Region"]

[Text] The vast Huanghuaihai plains are the nation's largest production area for wheat, corn, cotton, peanuts, sesame and tobacco. The plains are located south of the Great Wall, north of the Huai river, and east of the Tai Hang and Yuxi mountains and include most of Beijing, Tianjin, most of Hebei province, most of Shandong province and the portions of Anhui and Jiangsu which lie north of the Huai river. The plains have a total area of 380 million mu, with 271 million mu of arable land, the land reclamation index is 70 percent and the agricultural population is 139 million people, with farmers occupying 1.95 mu of arable land per person. The present level of production is relatively low so there is great potential for increased production and there especially is a great future in development of cotton growing.

### An Analysis of the Cotton Region's Economic Potential

In the mid 1950s, the Huanghuaihai plains were a relatively centralized cotton region, with over 30 percent of the arable land in most of the countries with concentrated cotton production given over to cotton fields, and with a few centralized counties having over 50 percent cotton fields. In 1956, cotton fields for the whole area stood at nearly 40 million mu, with total production reaching over 11 million dan, about 40 percent of total national production. For the next 20 years, not only were there great reductions in the cotton field acreage, for a long time the quantity and quality of production were stagnant and even declined. By 1979, the total cotton field acreage had declined to 25.6 million mu, ginned cotton production was only 9.04 million dan, 35 jin of cotton per mu, with a total production value of only 1.1 billion yuan.

In 1980, there was a great turnaround in cotton production. The entire area of 28 million mu of cotton fields had total output of 24 million dan, 85.7 jin per mu, an average increase of 1.7 times over the previous year. Far above the highest historical level. Total gross value, calculated for that year's standard prices, was 4.3 billion yuan, 3 times the previous year.

This brought great improvement to the lives and the production of the people of northeast Shandong, eastern Henan, and the plains north of the Huai river, so long subject to natural disasters and having low production levels.

According to the tentative plans made by the provinces and municipalities in this region, by 1985 the cotton fields for the entire region can be expanded to 50 million mu, occupying 20 percent of the arable land (40 percent in the Liaocheng area), with 100 jin of ginned cotton per mu and total ginned cotton production of 50 million dan. If this plan can be carried out there then will be great improvements in economic efficiency, as shown below:

(1) There will be full utilization of land resources, promotion of mutual progress for grains and cotton and increased production for both cotton and grains. This region has relatively abundant land resources, the land is level and basically is a plain at over 100 meters above sea level, the earth is thick strata, most of it is slightly alkaline tideland which is suitable for growing cotton and which, moreover, is suited to large-scale mechanized agriculture. The ratio of people to arable land is rather low, and the low-lying eastern plains have 2.28 mu of arable land per person. At present, the entire region has over 50 million mu of saline-alkali wasteland awaiting management and full utilization. Of this, there is 12 million mu of saline-alkali soil in northwestern Shandong alone which needs to be developed. If positive conditions can be created to make full use of this land, use the seed variety "Zhongmiansuo No 10," and implement a two-crop grain and cotton harvest system, then it will not be necessary to reduce the present grain field acreage and cotton can be used to accelerate grains and achieve both increased cotton and grain production. At present, the level of grain production in this region is still not high. The year 1979 yielded the highest level of foodgrain production, with 560 jin per mu of cultivated land, with 330 jin per mu of the sown area. If the area's acreage of cottonfields is expanded to 50 million mu, this not only will directly raise the current production level of 24 million dan to 50 million for the entire region, the overall production value will raise from the current production level of 24 million dan to 50 million for the entire region, the overall production value will raise from the current 4.3 billion yuan to 9 billion yuan. Moreover, there will be 11 billion jin of cottonseed oil, 8 jin per person. Each mu of cotton field can use 165 jin of cottonseed cakes, which will provide a 100 jin bonus of chemical fertilizer. The use of this fertilizer and the capital along with developments in animal husbandry will make it entirely possible to produce an additional 100 jin of grains per mou over the present production levels. In this way the region will have increased grain production of 20 billion jin. This not only will guarantee the continual increase of cash crops such as cotton, it moreover can make this region into a new community grain base for the nation.

(2) Because cotton production in China was stagnant for such a long time, there are contradictions between supply and demand so that every year, there is a need to import large amounts of raw cotton. In 1980 alone, there were 18 million dan of cotton imported, equal to one-third of the nation's total cotton production, at a cost of 1.7 billion US dollars of foreign exchange. This year, if this region does not produce nearly 15 million additional dan of ginned cotton, the state will then have to pay out another 1.4 billion

in foreign exchange to import even more raw cotton. If, by 1985, the 15 million mu of cotton fields in this region attain production of 100 jin of cotton per mu (total national production of 80 million dan of ginned cotton) we then will not have to import any cotton at all. Moreover, predictions show that there will be cotton goods exports which use up at least 20 million dan of cotton. According to current pricing for exports of cotton goods in the textile industry, this will produce an annual return of over 3 billion US dollars.

(3) Following the development of comprehensive utilization of the processing industry for agriculture and sideline products in the cotton growing region there can be processing of food products from cottonseed oil. The cottonseed shells can be used to raise mushrooms, tremella and glossy ganoderma. The cottonseed husks and the stems can be used to make synthetic fibers for rope and paper, stems can be pressed into fiberboard, stem cores can be used to make paper, and cotton phenol can be used in medicines. If the toxic elements in cottonseed kernels can be removed quickly enough, then 8 billion jin of cottonseed kernels can be used to make various high protein foodstuffs. This will greatly increase the economic income of people in cotton growing regions.

(4) After there are large increases in cotton production, there will be sufficient materials for the cotton ginning equipment and the nation's textile plants which can process 80 million dan of ginned cotton. With increases in high-grade textile products there will be rapid development of the clothing industry, which will provide employment for several million workers. Building a new textile production center in North China will bring basic changes to the Huanghuaihai plains where most areas have low production and suffer from national disasters. Moreover, this will bring about a new situation in our cotton production processing and textile industries and in the clothing industry.

#### The Promotion of Ecological and Economic Superiorities

The Huanghuaihai plains are ecologically and botanically the most suitable cotton growing region in China. Cotton growing in an ecologically suitable natural environment generally makes it easy to obtain the best results in production quantity and quality, and permits development of the superior natural ecological conditions found in that locale. And the presence of fine social, economic and technological conditions also permits full utilization of the region's superior conditions.

(1) Superior natural ecological conditions. This region has a relative abundance of light, temperature, water and land resources. First, it has 4,000-4,500 degrees centigrade [sic] of active accumulated temperature at 10 degrees centigrade, which clearly exceeds the requirements of intermediate maturing upland cotton; there are 175-220 frost-free days; the north cannot attain two harvests but the south does so easily. However, only slightly more than 10 percent of the cotton field acreage now has two harvests, so the productive season is not being fully utilized. Next, there are 2,200-2,900 hours of annual solar radiation and there is ample solar radiation in spring and cotton boll opening. However, at present, the utilization rate of solar energy

in an ordinary year is only 0.1-0.2 percent. Third, the annual rainfall is about 500-800 millimeters, the rainy and hot seasons occur together in summertime and meet the moisture requirements of cotton during the period of greatest growth and developments of cotton during the period of greatest growth and development. There is an uneven distribution of surface water and underground water, but the broad plains have conditions which generally permit the development of irrigation. The rivers and streams have a flow of about 120 billion cubic meters, more than 400 cubic meters per mu of arable land. There are about 40 billion cubic meters of supplemental underground water, about 150 cubic meters per mu. There are about 9 billion cubic meters of salt water. However, because of the low ratio of plant and forest cover there is only a short season for cover vegetation so that relatively large amounts of soil moisture evaporate and there is proportionately little benefit derived from this moisture. There is much runoff in the rainy season and very little water accumulation, so there is incomplete utilization of water resources. Because of the good light, temperature, water and land resources this region, early in the 1970s, it first began to reach ginned cotton production of 100 jin per mu, which was attained in Changwei prefecture of Shandong province, for example. Xinxiang county in Henan Province produced 140 jin of ginned cotton per mu and some brigades managed to produce as much as 150 jin per mu. Such evidence demonstrates that this region has great potential for the development of cotton production. Of course, there also are a number of disadvantageous natural factors. For example, there are frequent cool springs and early autumn frosts, there frequently are both spring drought and summer floods in the same year, and the summer rainfall is too concentrated, which causes many cotton bolls and buds to fall off. But experience in other regions shows that these problems can be solved by improved cultivation techniques.

(2) Superior social, economic and technological conditions. This region has at least 600 years of cotton growing history and as an old cotton region the cadres and masses therefore have long-term cotton growing experience. This region is located in the central plains with convenient transportation and communications. Between north and south there are the Beijing-Guangdong railway and the Beijing-Shanghai railway. Between east and west there is the railway from Gansu to the seaboard, ending at Lianyungang. Moreover, there is a network of public roads. The network for cotton purchase and processing extends throughout the entire cotton region and relies on cotton ginning capabilities of Hebei, Shandong and Henan. According to calculations, 45 million dan can be processed in 6 months. The textile mills of these three provinces have over 3.3 million spindles which can use up more than 12 million dan of raw cotton per year. During the past two years, total cotton production did not reach 10 million dan, which led to shipments of cotton from south to north and incomplete use of the cotton ginning and weaving capacity. If cotton planting for the entire region reaches 50 million mu, it will then be possible to utilize the above-mentioned superiorities.

#### A Path for Implementing Economic Growth

In order to fully develop the natural ecological economic and technological superiorities of the Huanghuaihai plains and struggle to implement the plan for economic growth in the expanded cotton region it is necessary to carry out the following tasks.

(1) Hasten the transformation from one harvest to two harvests and implement crop rotation of wheat, oils and green manure. For the last 10 years, 15 percent of the cotton fields in this region have had a two harvest system of wheat (oils) and cotton, and Shijiazhuang prefecture in Hebei reached 80 percent. In Henan, the prefectures of Zhoukou and Xinxiang reached 40 percent. The improved variety "Zongmiansuo No 10" has provided new conditions for implementing two successive crops or interplanting of wheat (oil or green manure) and cotton. Ongoing large-scale experimental planting demonstrates that planting successive crops of "Zhongmiansuo No 10" and wheat can produce over 500 jin of wheat and over 100 jin of ginned cotton per mu per year. The whole region has 50 million mu of cotton fields, so if 25 million mu have interplanting or continuous cropping of cotton and wheat, 15 million mu have successive crops of green manure and cotton and 10 million mu have successive crops of oil and cotton there will be obvious results in the use and nurturing of the land and in advancing all-round abundance of grains, cotton and oils.

(2) Improvement of the cotton region ecological system and raise the standard of natural energy transfer. Because this cotton region has not developed forestry, animal husbandry, green manure and legumes there is less than 7 percent forest cover, the utilization rate for agricultural resources transformation is very low, there is a decline in the production increases of chemical fertilizers, and the level of materials recycling for nitrogen was only 7-10 jin per mu. From now on, there must be strong improvements in this system's structure and capabilities, there must be energetic afforestation, construction of protective windbreaks for farm fields, implementation of forest and field intercropping, improvement of the farm field microclimate and provision of the "three supplies" (fuel supply, manure supply and fodder supply), and coordinated development of animal husbandry. At the same time, with the day-by-day development of agricultural and industrial production and the daily increasing shortages of water resources there is a need to implement coordinated water storage, irrigation and control of underground water levels and improvement of water use efficiency.

(3) Comprehensive management of low production fields and complete utilization of saline-alkali wasteland. The majority of fields in this region are low or intermediate-yield fields. There are nearly 50 million mu of saline-alkali land, manure and water conditions are poor and comprehensive handling must be exercised. There must be development of well irrigation and well drainage to reduce water salinity. Use of Huangho water for irrigation also requires drainage, and promotion of agricultural techniques for dryland crops will economize on water. Widescale planting of green manure and legumes will nourish the land and improve the soil.

(4) Cotton field distribution requires a suitable and quick solution for the excessively scattered current arrangement. Most cotton producing counties in this region have less than 100,000 acres of cotton, with a commodity rate of only 88 percent. Within the counties the cotton fields are also extremely scattered, so that it seems as if each individual county, commune and brigade were engaged in cotton growing. From now on there must be emphasis on constructing 80 counties of over 300,000 mu which emphasize cotton production, and there should be reductions of cotton producing counties having less than 50,000 mu. There should be rapid and suitable centralization of cotton fields in cotton producing counties.

(5) There must be rapid reform of the current cotton producing technology and the formation of a production technology system having increased production, stable production, superior quality and low waste. First, there must be simplified measures for cotton growing and through comparison of those which do not increase production efficiency or which are only slightly efficient but which use up large amounts of labor and capital must be eliminated. The labor force savings can be expended on cotton field basic construction or on diversification and thus bring about development of cotton field production. Second, the improved varieties must be popularized and the system of breeding the improved varieties should be perfected. These improved varieties must undergo strict regional testing and quality evaluation. There must be a search for a variety of suitable production systems and distribution systems for the improved varieties. Third, there must be firm support of comprehensive prevention of cotton diseases and pests. The process of building an ecologically balanced system for the cotton region must include development of resistant varieties, development of biological prevention and cure, and formulation of high efficiency, low toxicity new pesticides with a suitable period of effectiveness. Fourth, there must be gradual development of mechanized cultivation suitable for the cotton fields of the region, gradual research and formulation of cotton field machinery suitable for the system and special features of cultivation and crop growing in this region, and attention must be given to the suitability of machinery for cultivation techniques. We must do a good job of equipping the presently used farm tools.

(6) Establishment of a Huanghuaihai cotton research center, organization of research on key problems and establishment of a complete technology distribution center. The Huanghuaihai cotton region ought to establish an all-China cotton research center and individual provincial cotton (cash crops) institutes, as well as cotton research organizations in all cotton growing prefectures and counties. There must also be attention to cooperation in the division of labor, avoidance of all unnecessary duplication and waste, improvement of research efficiency and more publication of research results. All levels of agricultural departments and research organizations in the cotton region should establish complete technology distribution organs and form a structured network of technology distribution in order to guarantee the efficient spreading of the results of cotton-related science and technology.

11582

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PERFORMANCE REPORT PROVIDED ON NEW HYBRID COTTON VARIETY

Beijing ZHONGGUO NONGMIN BAO in Chinese 30 Sep 82 p 1

[Article: "'Zhongmiansuo No 10" Cotton Much Accepted by Huang and Huai River Area Cotton Farmers; Bumper Yields, Early Maturity, Superior Quality; Continuous Cropping of Wheat and Cotton for Two Crops in A Single Year"]

[Text] A new cotton variety bred by the Cotton Institute of the Chinese Academy of Agricultural Sciences, "Zhongmiansuo No 10" has shown heartening results in test plantings in cotton growing areas of the Huang, Huai, and Hai river areas during the past several years.

Natural conditions on the Huang-Huai-Hai Plain lend themselves to the growing of cotton and wheat; however, since the frost-free period is fairly short, only a single crop a year can be grown on an overwhelming majority of the cultivated land, and wheat and cotton compete rather heavily for the same land. The broad masses of people have hoped for new varieties of early ripening cotton and wheat to permit continuous cropping of wheat and cotton for two crops in a single year and bumper harvests from both.

By way of satisfying the demands of the broad masses of people, beginning in 1975, the Cotton Institute of the Chinese Academy of Agricultural Sciences used "Heishanmian No 1" as its basic material in two breedings, which produced a long fiber, bumper yield, superior variety, natural mutant strain, which was bred to become the early maturing "Zhongmiansuo No 10," which produces bumper yields and fairly good quality fiber cotton. For 3 years in a row from 1979 to 1981, this new variety had a part in regional experiments on varieties suited to a changed farming system in the Huang He basin where it was a frontrunner in both quantity and quality. Last year it was test planted on an area of almost 10,000 mu where wheat and rape had been preceding crops at 22 pilot projects in six provinces including Henan, Hebei, Shandong, Shanxi, Shaanxi, and Jiangsu. It produced yields of about 100 jin per mu where previous crop wheat yields had been 500-600 jin per mu. On the 320,000 mu on which its cultivation has been promoted this year, as of now, in an overwhelming majority of areas, cotton bolls have hung in clusters, growth has been heartening, and a bumper harvest is in prospect. In Linyi County in Shandong Province, where it has been promoted over the widest area, "Zhongmiansuo No 10" was sown in the summer on 100,000 mu. Though it encountered severe drought during the early stages, and though rainfall was concentrated in the middle stages, the cotton still grew better than last year.

Forecasts call for 105 jin per mu of ginned cotton (where the preceding crop had been wheat producing 359 jin per mu). Forecasts also call for the harvest of an additional 35.9 million jin of wheat and increased earnings of 9.8 million yuan as a result of the continuous cropping of both wheat and cotton on these 100,000 mu in the country instead of planting only spring cotton. As a result of the steady increase in the area continuously cropped to wheat and cotton, in many areas both total output of grain and wheat and average per capita distribution have increased rather remarkably. The broad masses of cotton farmers say happily, "A crop of wheat and a crop of cotton; it is white flour we eat; we have money in the bank, and life gets better and better." In the cotton growing regions of the Huang and the Huai a craze for the growing of "Zhongmiansuo No 10" has taken place, and it is predicted that next year from 5 to 10 million mu of it will be grown.

At a national "Zhongmiansuo No 10" on-site conference held in late September, cotton scientists and technicians from all over the country, leaders concerned, and peasant representatives observed and studied the "Zhongmiansuo No 10" production situation in the four counties of Linyi, Juye, Qufu, and Yanzhou in Shandong Province. They summarized and exchanged experience, explored the impact on the agricultural economic structure of the Huang-Huai-Hai cotton growing regions of this variety, and the value it should have for China's agricultural production. The conference unanimously agreed that "Zhongmiansuo No 10" is a rather good breakthrough variety that China has bred; that it tolerates waterlogging, tolerates salinity and alkalinity, and is strongly adaptable. In particular, its growing season is about 30 days less than for spring sown cotton in general, and when planted in tandem with correspondingly early maturing wheat varieties and rotationally cropped, two crops a year will be possible on the Huang-Huai-Hai Plain, and this will help solve the competition for land between grain and cotton. Nevertheless, it is prone to fusarium wilt, and it should not be grown in fusarium wilt areas. In promoting it to large area cultivation, all jurisdictions should pay attention to purification and rejuvenation of the variety, and do a good job of seed selection and seed retention work.

9432

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NATIONAL COTTON OUTPUT, PROCUREMENT PROSPECTS AT ALL-TIME HIGH

Beijing ZHONGGUO NONGMIN BAO in Chinese 30 Sep 82 p 1

[Article: "More Than 2.5 Million Dan of Ginned Cotton Procured Nationally; Prospects That This Year's Procurement Will Again Reach All-Time High"]

[Text] Ever since the Third Plenary Session of the 11th Party Central Committee, China's cotton production situation has become better year by year. The more than 86 million mu area sown to cotton this year is 8.7 million mu more than last year, and the highest year since the 1960's. During July and August many cotton growing areas had long overcast and rainy periods, and some were even stricken with hailstones and typhoons, which hurt blossoming and boll formation. However, thanks to the steady implementation and perfection of production responsibility systems, cotton farmers actively worked to prevent and combat disasters, thereby reducing losses. If no exceptionally large disasters occur from now on, prospects are that this year's cotton procurement will reach an all-time high. Statistics as of 20 September show more than 2.5 million dan of ginned cotton as having been procured nationally, more than 1.3 million dan in Shandong Province, and 5.4 million dan in Hebei, more than 500,000 more in each case than during the same period last year. Spurred on by the spirit of the 12th Party Central Committee, the broad masses of cadres and people in cotton growing areas eagerly sold more and better cotton to the state following harvesting of a bumper crop. Cotton procurement departments everywhere are now in processing of doing a good job of sales organization work, setting up sales points in designated areas, arranging allocation times, weighing several times amounts taken in, establishing more windows for settling accounts, and such matters to achieve proportional sales by production teams, work teams, and households against vouchers.

9432

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# SUCCESS REPORTED IN REMOTE HYBRIDIZATION OF NAKED OATS

Beijing GUANGMING RIBAO in Chinese 23 Sep 82 p 1

[Article: "Middle-age Agricultural Researcher Li Chengxiong [2621 2052 7160] Wins Honor for Yanbei People by Breeding China's First Remotely Hybridized New Naked Oats Variety; Yields of 550 Jin Per Mu, About a 10-Fold Increase Over Local Traditional Varieties"]

[Text] Forty-three year old agricultural researcher, Li Chengxiong, has bred China's first remotely hybridized new naked oats variety, multiple spike naked oats. Yields are 550 jin per mu, which is about 10 times that of local conventional varieties. Recently Li Chengxiong has been hailed as a model science and technology worker in Yanbei Prefecture, Shanxi Province.

Li Chengxiong is an assistant researcher in the Frigid Region Crop Institute of the Shanxi Provincial Academy of Agricultural Sciences, and director of its naked oats research office. Following graduation from agricultural technical training school in 1961, he was assigned to this institute to do naked oats breeding work. Oats tolerates infertile soil, is drought resistant, is rich in nutrients, releases large amounts of calories, and contains more fat, protein, calcium, iron, and riboflavin than both husked rice and wheat flour. It is "a treasure" of the people of Yanbei. Yields were only 35 jin per mu, so in order to breed a high yield superior variety of naked oats for the benefit of the people of Yanbei, Li Chengxiong took several years time and visited almost 100 production teams in the naked oats growing region to collect large quantities of breeding materials. It was from peasant varieties that he selected several high yield varieties. In 1964 he began the work of crossing naked oats varieties, but his experiments did not earn the serious attention of leaders, the experiments were very poor, and he had no workers to help him. He had more work than he could do, so he often had his wife and son help. In this way he overcame great difficulties, finally breeding hybrid variety "Yanhong No I-14" in 1979 with yields about double those of old varieties. This won him a second prize for accomplishments from the Shanxi Academy of Agricultural Sciences.

In the early 1970's, Li Chengxiong spotted a mutant plant with dense spikes, numerous pods, and numerous grains from an atomically radiated variety. He analyzed the main reasons for low naked oats yields as being spread out spikes, few pods or grains, and a not high weight per thousand grains. Were he able to breed spikes like those on the mutant, high yields would be possible. In

order to get more good mutant plants, he began to collect plants in six provinces and autonomous regions including Hebei, Nei Monggol, Gasu, and Ningxia. The result was collection of only somewhat more than 70 mutant plants of pi [4122] oats. Pi oats and naked oats are of different species, but Li Chengxiong discovered that they had identical numbers of chromosomes and he thought to himself that if successfully hybridized, a high yield variety might be bred. Li Chengxiong thereupon began breeding work on the remote hybridization of naked oats. At first the hybridized plants would not set grain, and later after setting grain, they became mongrelized. After repeated failures, a comrade who was working on the experiments with him lost confidence. But Li Chengxiong remained steadfast. Since the two set grains following crossing, there was hope. During the season for sowing in 1974, Li Chengxiong had to go to hospital for surgery to remove a large growth on his back. He was afraid he would miss the sowing season, so before his wound had healed he hobbled off on crutches, his back bent, to the experimental ground. This year a distinctive oats plant with dense spikes and numerous pods grew in the experimental ground, and Li Chengxiong was captivated by this oats plant. As expected, he collected more than 180 grains of pure naked oats seeds from this distinctive plant. He was tickled pink and quickly ran to the institute's CPC committee secretary and said, "Distant hybridization has succeeded." Later on this new naked oats variety was experimentally grown in Shanxi, Nei Monggol, and Hebei with results in yields averaging 550 jin per mu with some as high as 675 jin. Cadres and masses said that Li Chengxiong did meritorious service for the people of Yanbei. This year both Yanbei and Xinxian Prefectures have promoted this variety of naked oats to cultivation on more than 100,000 mu where mostly it is growing very well and may produce an all-time high output. Now Li Chengxiong is busy writing pertinent chapters in China's first book on "Chinese Naked Oats."

9432

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## RURAL ECONOMIES URGED TO BLAZE NEW TRAILS IN ECONOMIC DIVERSIFICATION

Beijing ZHONGGUO NONGMIN BAO in Chinese 23 Sep 82 p 1

[Article by commentator: "Break Through the Old Rigamarole To Study New Problems"]

[Text] Today rural villages have fairly generally established responsibility systems linked to output. After most basic accounting units have instituted "double contracting" [contracting with individual households for task completion and output quotas], in particular, what is to be done in the case of existing collective enterprises? How are the newly emerging associations among the masses to be regarded? This is a new problem about which people are concerned. Comrade Hu Yaobang, in his report to the 12th party Central Committee titled, "The New Situation in All-Around Initiation of Socialist Modern Construction" made an extremely important exposition of this problem. After pointing out the basic principle that "in rural villages, the cooperative economy of collective ownership by the working people is the principal economic form," he particularly stressed that "development of the agricultural economy and improvement in peasant capabilities to administer and manage, will inevitably pose new demands for associated operations of all kinds." We should promote diverse forms of economic association genuinely on the principles of benefits to production and voluntary participation for mutual benefit.

China's agriculture has to take the path of economic diversification. Development of economic diversification requires encouraging the country, collectives, and individual commune members to rise together. This is the correct program and policy formulated by our party so that the 800 million peasants will become prosperous with all possible speed. China's commune and brigade enterprises are a force that is not to be ignored. Today they hold more than 50 billion yuan of property, employ more than 30 million people engaged part time in industry and part time in farming, and have an annual output value of more than 70 billion yuan. They play a very important role in the employment of surplus workforces, in enlivening the rural economy, in assisting national construction, and in increasing peasant income. In the process of their development, commune and brigade enterprises experienced problems in rash action, blind building of plants, poor management, and not very high benefits. Through future reorganization, these problems can be solved for healthy development of the enterprises. Development of rural collective enterprises has also been fettered by some old rigamarole. Formerly many people believed that only communes and brigades could run enterprises and that production teams could not do so, much less commune members.

However, since the 3d Plenum of the 11th Party Central Committee, changes in the rural situation have broken through this old rigamarole. Facts have shown that not all communes and brigades necessarily have conditions requisite to the running of enterprises, and that enterprises do not necessarily have to be run by communes or brigades. To meet the needs of the development of production, specialized households, multiple occupation households, and all kinds of new economically associated groups have gradually begun to grow. Collective enterprises operated by persons adept at administration and possessed of skills in conjunction with workers can equally play a positive role in development of production. We should thoroughly investigate and study these new associated enterprises, diligently summarize their experiences, and help their healthy development genuinely in accordance with the principles of advantages for production and voluntary participation and mutual benefit. Structure of a socialist agricultural economy has to be diverse. Only in this way can more rapid development of socialist productivity be advanced so that the superiority of the socialist system is brought into full play. While actively fostering commune member household sideline occupations, we should strive to operate various kinds of cooperative enterprises collectively owned by rural working people.

A look at the development of rural economic diversification shows that in the development of these enterprises it is necessary to take into consideration local skills, the economy, transportation, markets, and such conditions, and to consider in combination the problems of supply, production, and marketing. Just what provisions are made will depend on local realities. Conditions vary from place to place, and many types of enterprises may come into being. In areas close to large cities or near certain developed areas, conditions exist for the operation of some labor-intensive industrial enterprise to serve large industry. In most places, however, economic diversification will consist of farming, livestock raising, or processing. Right now some circumstances merit attention, such as the following: Everywhere today households specializing in the raising of livestock need others to help them solve problems in producing young animals, livestock feeds, technical guidance, and marketing of products. Once products of the livestock breeding industry have become more numerous, some will require local processing and storage followed by continuous marketing elsewhere. If some products cannot be sold, it may not be for lack of demand, but because they cannot be transported elsewhere. To solve these problems, the state will have to make plans and collectives will have to get to work. Operation of some young animal farms, livestock feed processing plants, farm product processing plants, technical service stations, marketing outlets and storage and transportation departments under guidance of state economic plans and through the use of collective strength fits in with needs. Where existing commune and brigade forces cannot solve the problems, commune members may organize to pool funds to conduct activities. When a single unit or a single place cannot solve the problems, it may associate with other units or other places in joint efforts toward solutions. Where grassroots cannot solve the problems, leadership organizations above the county level should organize the necessary cooperation. Pilot projects may be used to solve these kinds of problems, to gain experiences, to work out a rational structure, and to move economic diversification gradually toward specialization and socialization.

Breaking through old rigamaroles to study new problems, use of pilot projects to gain experiences, and making collective enterprise avenues ever wider so that the rural economy will become ever more lively are major problems in continued development of the very fine rural situation.

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## CHANGES IN CHRONICALLY DEPRESSED COUNTY ECONOMIES REPORTED

Beijing RENMIN RIBAO in Chinese 16 Oct 82 p 2

[Article: "Appearance of a New Outlook Caused by Initial Tapping of Potentials--Notes on the Changes in the Ten Chronically Backward Counties in Anhui Province--On All-Out Efforts to Develop a Diversified Economy, Spurred by Party Policies"]

[Text] In terms of time, 3 years is only one-tenth of 30 years, but in the no notorious chronically backward counties of Anhui Province, increase in production figures for the 3 year period from 1979 to 1981 was greater than for the 30 year period from 1949 to 1978. Statistics show a 1981 increase in grain output of 2.239 billion jin over 1978, and an increase of only 1.317 billion in the grain output in 1978 over 1949; a 300 million jin increase in oil bearing crops in 1981 as compared with 1978, and only a 36 million jin increase in oil bearing crops in 1978 as compared with 1949. Average per capita increase in income for 1978 was about 40 yuan greater than in 1949, while the increase was 152.40 yuan in 1981 as compared with 1978.

The 10 counties in this chronically poverty stricken area are Si County, and Wuhe, Lingbi, Guzhen, Dingyuan, Fengyang, Jiashan, Xuancheng, Langqi, and Guangde counties. They are located on the Huaibei Plain, the hill region of the Chang Jiang and Huai Jiang, and in the mountain region of southern Anhui. They contain a 5.55 million population and 10.89 million mu of cultivated land. Since the Third Plenary Session of the 11th Party Central Committee, these 10 poor counties have made great strides in catching up, and half of them have vaulted into the ranks of the province's advanced counties.

## Heartening Reports from "Beggar Villages"

In May this year, Anhui Provincial CPC Committee secretary, Wang Guangyu [3769 0342 1342] received a letter from a Huaibei rgral village. On opening it he found that it contained a heartening report mailed by commune member Chen Yuzhi [3769 3768 5347] at Huangzhuang Proeuction Team, Huangzhuang Production Brigade, Maoqiao Commune, in Guzhen County. It reported three heartening situations to him. First was the harvest last year of 10,000 jin of grain for economic income of 5,000 yuan. Second was the building

of four new tile-roof houses. Third was that her three sons had become engaged to be married. Chen Yuzhi had owned the house in which Wong had stayed 15 years previously when he had been sent down to the countryside to toil, and it had been in her house that he had eaten and lived. At that time Xiaohuangzhuang had been a "poverty-stricken beggar village" where no one ate wheat flour or rice or lived in a tile-roof house. Now upon learning that such great changes had taken place for Chen Yuzhi's family, he was really excited.

On 14 August on this way back from attending the Seventh Plenary Session in Beijing, before arriving at Hefei, he got off the train in Guzhen specifically for the purpose of going to Xiaohuangzhuang to visit the country relatives he had not seen for many years. No sooner had he entered the village when commune member Chen Yuzhi, her face wreathed in smiles, welcomed him to her home. Chen Yuzhi said, "Today is greatly different than 15 years ago! It would have been impossible then for me to have given you a steamed white bread. But now everybody has white steamed bread to eat, and every household has grain on hand. My family has the equivalent of more than 1,000 jin of wheat per person this year, and not only will we be unable to eat that much, but we worry about not being able to sell it!" The production brigade secretary also interjected, "These 3 years have brought rice and wheat flour to eat, the building of tile-roof houses, and each year has been better than the previous one! We used to lack food, not have enough to wear, and go begging, but now every family makes a contribution. Last year this production team contributed more than 30,000 jin of grain to the state. For wheat alone, each person sold an average of 250 jin, more grain than they had harvested 3 years earlier!"

The changes that had taken place in Xiaohuangzhuang were a microcosm of the changes that had taken place in countless "beggar villages" in the 10 poor counties. Guzhen County, in which this village was located, had been the poorest of all the 10 poor counties. In the 13 years between the establishment of the county in 1965 and 1978, its people had eaten a total of 124 million jin of grain sold back to them by the state, and many peasants had been unable for a long time to break out of their poverty stricken situation of "planting in spring, harvesting in fall, and fleeing from famine in winter, sweet potatoes being their staple food." During the past 3 years, not only has the problem of sufficient warm clothes to wear and food to eat for the masses been solved, but with a single leap the county has gone from being the one that ate the most grain sold back to it by the state to an advanced one that made an annual contribution of 174 million jin of grain to the state, each person initially providing more than 600 jin of commodity grain. A 60-year old commune member named Ou Mingxian [0575 2494 6513], who everyone calls "Old Grouch," lives in Ouxi Production Team in Aingliang Production Brigade, Qingliang Commune. After institution of "large scale contracting of full responsibility for completion of work tasks," the party's policies made him a little more open-minded and widened his thinking horizons. Last year his family of four sold the state 15,000 jin of grain, 7,000 jin of which was wheat. This summer his family harvested 14,000 jin of wheat, and he sold the state 10,000 jin in a single season.

## "Airport" Removal

Pronounced characteristics of the 10 poor counties are small population relative to available land and great potential. Three years ago when the correspondent passed through Dingyuan, Fengyang, and Jiashan counties, it was possible to see large flat areas of wasteland at any time where no crops but only weeds grew. In some places there was more than 1,000 mu of such land extending far off into the distance like the broad runways on which aircraft take off and land. Consequently, the local people called this stretch of wasteland "the airport."

Today, one after another, high yield models have taken off from this "airport," and no longer does a barren vista loom before one, but rather a boundless tract of golden paddy rice, and glossy green peanut, soybean, and sesame crops. A comrade in charge at the Dingyuan County CPC Committee told the correspondent that the county use to have 200,000 mu of big and small "airports," that had turned into "granaries" during the past 2 years, providing more than 80 million jin of commodity grain and oil-bearing crops to the state annually and creating considerable wealth. As peasant levels of scientific farming increase, the potential of the "airfields" has become greater!

"From a burden to wealth has been the result of 'contracting'". With no campaigns that shake up people, elimination of "eating out of a large common pot," institution of large scale contracting of full responsibility for completion of work tasks, county CPC committee diligent implementation of specific regulations pertaining to unworked wastelands, "four-besides land" (beside homes, beside roads, beside rivers, and beside mountains) with ownership going to whomever develops them, and those who do the planting getting the harvest, suddenly commune member enthusiasm for production has been aroused.

In the course of our visit to Dingyuan County's rural villages, we heard numerous moving stories about the development of the "airports." At Xiapang Production Team in Gengxiang Production Brigade, Gengxiang Commune, the heads of 11 households served as production team leaders, which meant they were unable to give full attention to their fields and yields declined, leaving behind an "airport" each year. In many years yields from then were only about 100 jin per mu and wheat rations did not amount to much. Up until 1978 total annual grain output was no more than 30,000 jin. In 1979, old brigade leader Liu Jiasheng [0491 1367 0524], who had been forced to step down on several occasions, resumed his responsibility for the entire production team, instituted the contracting of output to individual households, and rallied everyone to march on the "airports." Quite a few commune members were apprehensive and were slow to act. He thereupon both publicized the party's policies and took the lead in being an example. He led his family of seven in farming the land for which it had contracted while at the same time reclaiming for cultivation 15 mu of wasteland, which they planted to fennel, sweet potatoes, paddy rice, and soybeans. At his urging commune members in the production team opened to cultivation more than 200 mu of "airports" within 3 years, harvesting more than 60,000 jin of grain from these lands alone. This was twice the brigade's total grain output in 1978.

Commune members said, "the land has changed much; the soil has become more fertile; people work harder, so how could there be anything but increase in production!" Last year the brigade's grain output vaulted from the 30,000 jin of 1978 to 183,000 jin, an output averaging 16,600 jin per household. Economic diversification also advanced very rapidly with annual per capita net income increasing from somewhat more than 50 yuan 3 years previously to somewhat more than 500 yuan. The masses happily sang, "Xiapang, Xiapang, where granaries are full of grain and ponds full of fish, where people have new clothes to wear and new houses to live in."

There were more places in Dingyuan County like Xiapang. In 3 years agriculture throughout the county made three giant strides. Grain output increased by 100 million jin in a year, output going from 440 million jin in 1978 to 750 million jin, and gross output of oil-bearing crops shot up from somewhat more than 20 million jin to somewhat more than 80 million jin for a manifold increase in contributions to the country. In 1980 the county used "households with an output of 10,000 jin of grain" as the standard for selection of "outstanding households" that had become wealthy through labor, but in 1981 the criterion for participation in the countrywide "outstanding household" conference was changed to "households who had sold 10,000 jin of grain." This change was made because in that year the number of households that produced 10,000 jin of grain shot up from the somewhat more than 300 of the previous year to more than 10,000!

In the other nine poor counties, the situation was very much the same. In 1979, "10,000 jin of grain households" were scarcer than hens teeth in these 10 counties, but by last year there were more than 10,000 of them!

#### More to be Done About "More"

Following the Third Plenary Session of the 11th Party Central Committee, "leftist" influence was swept away and people in mountain regions removed their shackles. County CPC committees in Xuan, Lang, and Guang counties in the mountain region of southern Anhui Province shifted the focus of work in the mountain region from the former sole emphasis on grain to development of forestry and economic diversification. As a result, the mountain region gradually began to come alive.

Xuancheng County proceeded from realities in an adaptation of general methods to the local situation to build 10 economic diversification bases for forestry and tea, honey dates, tung oil trees, silkworm mulberry, Chinese herbal medicines, fish raising, etc. In addition it gave energetic encouragement to commune members to use the space in front of and beyond their houses as well as privately retained mountains and private plots to develop the "10 smalls," i.e., small wooded groves, small orchards, small tea farms, small mulberry groves, small fish ponds, small plant nurseries, small tung oil groves, small plaiting plants, and small livestock farms. Xiting Production Brigade in Yingliu Commune in this county used the "four besides" to develop small woodlands where it planted 150,000 trees of various kinds, or an average of somewhat more than 1,100 trees per household. In Langqi County, the number of households specializing in various aspects of the breeding

industry alone have grown to more than 8,900, or 16.5 percent of the total number of peasant households in the county. In Yeji Production Team in Daji Production Brigade, Dongxia Commune, duck raising hand, Ye Shengxu [0673 3932 1331] who was criticized for raising ducks 10 years ago, last year raised 170 ducks in sheds with the encouragement and support of leaders at all levels, and sold 3,400 jin of duck eggs to the state for a net income of more than 3,800 yuan to become a famous household in the county that prospered by working. On two occasions, he had the honor attending county and provincial meetings of delegates advanced in economic diversification.

Party policies have been like a golden key that has opened the main door to prosperity in mountain regions. Sihe Commune in Guangde County is a prominent example. Three years ago this commune was still fairly poor. Since 1979, however, the commune CPC committee shifted the focus from sole attention to farmlands to mountains where it began afforestation in vigorous development of economic diversification. Within the period of 3 years, the commune afforested 50,000 mu of barren mountains, planted more than 1,600 mu of economic forests of silkworm mulberry, chestnut, and tung oil trees, more than 500,000 lacquer trees, and more than 4,000 mu of round bamboo. Last year the commune produced 6,000 dan of chestnuts, selling 5,500 dan or half the amount purchased from the county, to the state, becoming famed as a "land of chestnuts." In 1979 and in 1981, this commune used its advantages in having large numbers of silkworm cocoons and a large workforce to build a textile plant and a filature mill, making the raising of silkworms, the reeling of silk, and weaving of cloth a continuous process. Since last year the textile plant has produced 200,000 soft silk quilt covers in satin weave, which are enjoying sales in Tianjin, Shanghai, and elsewhere. In addition, in the past 3 years it has used local resources to run a food products plant, a large tile plant, a lace industrial arts plant, and a fluorspar mine as part of 20 commune operated enterprises. It has started construction of a reservoir with a water storage capacity of nearly 4 million cubic meters, and has built 20 small hydropower stations so that almost one-half of the commune's wetlands are unaffected by waterlogging or drought, and more than 60 percent of production teams and commune members have electricity. Last year the commune's gross income from economic diversification amounted to 4.75 million yuan, three times that of 1978. Income from economic diversification as a proportion of gross income from agriculture rose from 30 percent to 70 percent, and commune member average per capita income increased from 100 yuan to 311 yuan. Now Sihe Commune has become a thriving new socialist mountain village where the mountains are green and the water clear. It has blazed a new trail toward prosperity for the mountain regions of southern Anhui.

Heartening changes have taken place during the past 3 years in the appearance of the mountain region in Xuancheng, Langqi, and Guangde counties where farming, forestry, livestock raising, sideline occupations, and fisheries mutually support each other for a fine situation of comprehensive development. Comparison of last year with 1978 shows total grain output in the three counties to have increased 30 percent, and income from economic diversification to have more than doubled, total earnings from economic diversification as a proportion of total earnings from agriculture having risen from 40 to 54 percent, and average per capita commune member earnings having increased from 105 yuan to more than 240 yuan.

Now, the people of these 10 counties, given encouragement by the 12th Party Central Committee, are writing a new chapter in the building of new rural villages and becoming prosperous through labor.

PROBLEMS, PROSPECTS IN RURAL PREFECTURE IN ANHUI SCRUTINIZED

Beijing ZHONGGUO SHEHUI KEXUE [SOCIAL SCIENCE IN CHINA] in Chinese No 3, 1982 pp 73-110

[Article by Chinese Rural Development Problem Study Team: "Several New Problems in Rural Development--A Survey of Rural Villages in Chuxian Prefecture, Anhui Province Following 'Double Contracting to Households'"]

[Text] Editor's Note: This article is a survey report on rural villages in Chuxian Prefecture, Anhui Province. This survey report makes clear that establishment of production responsibility systems of "double contracts" with households [contracting for fixed output quotas from households and contracting responsibility for full task completion with households], stirred peasant enthusiasm for production to an extreme extent, but also posed numerous new problems requiring solution.

This article emphasizes exploration of several problems including grain production, land contracting, the gap between poverty and riches, the direction of flow of workforces and funds, new cooperative associations, the functional structure of the rural economy, and rural grassroots cadres. The author believes that study of these new problems and new trends in rural development hold major theoretical and practical significance for understanding the orientation of rural economic development, and for further development of a very fine rural situation so that reform of the rural economic system will be carried out in a healthy way.

The author of this survey report, the Chinese Rural Development Problem Study Team, is a sparetime academic study organization composed of a few score young theoretical workers, research fellows and university students who work under the guidance of the Agricultural Economy Research Institute of the Chinese Academy of Social Sciences.

China's farflung rural villages are currently undergoing a thorough economic restructuring. The unprecedentedly high enthusiasm for production of hundreds of millions of peasants is a major mark of the success that this restructuring has achieved. Establishment of various forms of production responsibility systems makes a fine starting point for this restructuring. The economic accounting units in rural villages throughout the country that have already set up various forms of a production responsibility system number 97.8 percent of all economic accounting units, and those practicing "double contracting to households" (contracting production to households and contracting work tasks to households) is close to 50 percent. Establishment of production responsibility systems far exceed their original significance; they are, in fact, a partial readjustment of production relationships. Thus, study of the new problems and new trends following institution of various forms of responsibility systems, and particularly following institution of double contracting to households, holds major significance for further development of the very fine rural situation and for promoting the smooth socio-economic restructuring of rural villages.

In this connection, we conducted a survey in Chuxian Prefecture, Anhui Province during July and August 1981. This survey centered around "the new problems and new trends that had appeared in rural development following double contracting to households." In Chuxian Prefecture rural villages instituted various forms of responsibility systems at a fairly early time, and now double contracting to households is done in more than 97 percent of all households. This prefecture is located in the hills between the Yangtze and Huai rivers where natural conditions are moderately good. Prior to 1977 the prefecture was below average national levels in terms of average agricultural output value for the rural population, as well as in terms of grain output and commodity rate. During the last 2 years it has greatly exceeded the average national levels.

The main focus of our survey was on the following several problems:

#### I. Grain Output Problems

It is common knowledge that no great change in the diet of the Chinese people is possible within a short period of time, and that for a fairly long period of time both agricultural production and food consumption must be chiefly in the form of grain. The outlook for grain production has a great bearing on growth of China's national economy. What is the situation in grain production in areas where double contracting to households has been done, and what is the trend of development? The Chuxian Prefecture survey helped enlighten us.

##### 1. The Shortterm Trend in Grain Production

Chuxian Prefecture has 6.5 million mu of cultivated land (actually more than this figure). In 1976 and 1977 it produced 2.8 billion jin of grain annually.

As a result of severe natural disasters in 1978, this figure fell to 2.3 billion jin. In 1979, despite disasters one after another, as a result of the initiation of the contracting of production to teams, it again rose to 2.8 billion jin. In 1980, by which time half of all production teams had instituted double contracting to households, grain output totaled 3.2 billion jin for a net increase of 400 million jin. In 1981, when more than 90 percent of production teams were practicing double contracting to households, grain output totaled 4 billion jin, a net increase of 800 million jin. Within the very short space of 2 years, a greater than 40 percent increase occurred with unprecedented rapidity.

The most fundamental reason for this increase was the liberalization of rural economic policies and institution of responsibility systems of double contracting to households that followed in the wake of the Third Plenary Session of the 11th Party Central Committee and aroused extreme peasant enthusiasm for production. Specific reasons were: First, expansion of the cultivated area and increase in the land's extensive utilization rate. Abandoned and waste lands were brought under cultivation for an increase in the grainfield area. Second, intensive farming for an increase in yields per unit of area. This was an increase in input of labor, improvement in field care, greatly increased use of chemical fertilizers (the prefecture using in 1981 double the amount of 1979), further promotion of superior crop varieties, increase in the multiple cropping index, etc.

## 2. Shortterm Forecast for Grain Output

Following the double contracting to households, grain production expanded very rapidly, but will it be possible in future years to continue this fairly rapid speed of growth? This is a problem that concerns everybody. According to estimates made by comrades in the policy research offices of the Fengyang and Dingyuan County CPC committees, in normal years grain output can continue to increase for from 3 to 5 years at a 5 to 7 percent rate of speed. The principal bases for the sustained fairly rapid growth in grain output for the past several years have been the following:

- (1) More sensible input of labor and further improvement in field care;
- (2) continued increase in the amount of barnyard manure used for improvement in the soil's physical structure and an increase in its fertility;
- (3) increase in quantities of chemical fertilizer used;
- (4) further promotion of superior varieties; and
- (5) increase in high yield dryland crops.

In short, the increases in grain output over the next several years will depend to a fairly large extent on increases in yields per unit of area. Today, grain yields in Chuxian Prefecture as figured on the basis of area sown amount to only 300 jin per mu. Within several years, fairly substantial increases in yields per unit of area are entirely possible.

However, after 1985 unless appreciable improvements are made in agricultural production conditions and the farming system, the speed of increase in grain



production will slacken and become low-speed growth. The main foundation for this contention is as follows: (1) difficulties in further increasing either the cultivated land area or the area sown to grain. To bring virgin soil under cultivation will mean intensification of erosion and destruction of the ecological balance, the losses outweighing the gains; (2) difficulties in continuing to increase the multiple cropping index; (3) difficulties in continuing tremendous increases in chemical fertilizer supply; (4) difficulties in further improving water conservancy conditions within a short period of time; and (5) because of insufficient fertilizer, the soil is asked to produce more than it can. In summary, unless existing production conditions meet requirements for continued growth of production and are substantially improved, the speed of growth of grain production will be very limited.

This shows that as a result of increase in peasant enthusiasm following institution of double contracting to households, sustained increase in grain production over a period of 3 to 5 years is possible. However, unless attention is given improvement of existing production conditions and new farming programs adopted, such as banding together for farmland capital construction and creating a new type farming system suited to the scale of operations, it will be impossible to continue to maintain the present growth impetus and the speed of development must inevitably slacken. A country as large as China must commit itself to solution of its own grain problems and "positively no slackening in grain production" must become our basic national policy. The problem is that in some future years, conditions that limit growth of grain output will become increasingly numerous, and potential for use of existing production conditions will become increasingly less. We should begin now to study prospects for grain production and take the necessary action for sustained growth of both grain production and other economic diversification as well.

## II. Problems in Farming the Land

Land is the basic element that limits agricultural development. A fundamental characteristic of double contracting to households is dispersal of collectively owned land to peasant households for farming under contract. Peasant enthusiasm for farming the land has been aroused. Formerly rectangular plots were farmed as gardens, but now gardens are farmed as rectangular plots once again. Borders and corners of fields, and areas in front of and behind houses are used, small size farmland water conservancy facilities within the area farmed by peasant households have also been rapidly put in operating condition. Peasant households have self-determination; they may plan their crop rotation rationally on the basis of soil fertility and market demand under guidance of state plans. Both land utilization rates and results from farming have generally increased. All this makes for very great progress over the former method of a "great hullabaloo." However, this does not mean that all the problems in peasant household contracting the farming of public land have been solved. As a

result of the Chuxian Prefecture survey, we feel that the following several problems exist in farming of the land that are related to double contracting to households.

#### 1. Land Contracting Problems

Land can be good or bad, distant or near, wet or dry, flat or hilly, and differences in water supply situations may also exist. In contracting land, a method of matching up to make an average is mostly done, and this causes substantial fragmenting of the contracted land. Not only does this fragmenting make for inconvenience in peasant field operations and care, but even more importantly it plays hobs with the water system. Crop varieties and rotation of crops differ from one household to another, and both amounts of water used and times of use vary, conflicts in the use of water frequently resulting. In Chuxian Prefecture, wetlands account for 58 percent of the cultivated land area. During the past 2 years there have been no very large disasters in the prefecture, but between 20 and 30 percent of all civil incidents have related directly to arguments about use of water. Were there to be a serious drought, there would be even more conflicts.

Not only this, but because the population is large relative to available land, in most communes and brigades the land was proportionally contracted according to population, or according to population and the workforce. However, the size of the population and workforce frequently changed. In our survey of 2,079 households in four communes in two counties, in the space of 2 years population changes took place in 325 households for a change rate of 15.6 percent. Of these, the change rate was 10 percent in the contracting of land on the basis of population. Where land had been contracted in proportion to both population and workforces, the change rate was about 20 percent. During the past 2 years increase or decrease in population occurred in 12 of the 34 households in the Guojia Small Team of Jiangshan Production Brigade in Jiangshan Commune in Fengyang County. This was 35 percent of the total number of peasant households. In 10 of the 25 households in the Xiaowang Production Team of Qianjin Production Brigade in that same commune, population increases or decreases occurred. That was in 40 percent of all households. In Daqihe Commune in Fengyang County, in 12 of the peasant households that held certificates showing birth of only a single son or daughter, none of the sons or daughters were contracted land. In some cases where young men had married and born a child, one-tenth of a mu of land was contracted for all three. In places practicing double contracting to households, land in an overwhelming majority of communes and brigades has already been completely contracted and it has been expressly provided in writing that no changes are to take place for several years. As time passes, changes in both population and workforces will continue to occur. Thus, the issue of readjustment of land contracting must be put on the agenda.

On the question of land problems requiring readjustment such as fragmentation of land for contracting, playing hobs with the water system, and population

changes, Chuxian Prefecture already has fairly good experience. Beginning in 1980, Songshushan Small Team in Sansheng Commune, Quanjiao County evaluated output of each and every natural plot of land, finding maximum yield of 700 jin per mu and a minimum yield of 400 jin per mu. It followed this with an assessment of 3.50 yuan for every 100 jin of evaluated yield to be payed as a state purchase quota and collective withholdings, which was also prorated for plots of different quality, more being assessed for use of good land, and less being assessed for poor fields to balance out differential incomes from different quality plots contracted for. The brigade also carried out a pond by pond evaluation of large and small ponds in terms of their different water storage capacities, large ponds to be used in common and those using small ponds to get supplementary amounts of water from the brigade according to a unified system, thereby solving problems arising out of different water conditions. Proceeding on the basis of evaluation of yields for fields and evaluation of water in ponds, the brigade layed out new continuous strips of land on the basis of different water systems serving them to replace the system whereby land that had been divided into pieces following contracting, thus helping farming. Following such readjustments, commune members were relatively satisfied. During the year preceding this readjustment of land there had been 10 civil quarrels resulting from water use, but following readjustment, there were none. Furthermore, water conservation facilities were put under the care of specific people with commune members taking the initiative in maintaining them in good repair to change the former system of "swarming to use water, but not moving to repair the ponds."

When Xiaowangzhuang Production Team in Jiangshan Commune, Fengyang County instituted contracting of production to individual households in 1979, it held 20 mu of fields in reserve. Should anyone leave the production team as a result of marriage or death, they had to surrender their land and the land became a reserve under centralized control of the production team. Reserve fields were ordinarily contracted out to peasant households with large numbers of workers. When the production team's population increased, an average 2 mu per person of reserve fields was contracted out. In view of the production team's anticipated population increase under its birth control plans, this method will be able to satisfy demands for land resulting from population increase for up to 10 years.

## 2. Land Utilization Problems

Following double contracting to individual households, the peasants generally planted crops on their land that brought high profits and quick results. They adopted some measures to increase results that were effective at once and did not take the initiative to farm crops requiring several years before benefits could be reaped. They were unwilling to use measures for increasing output that brought longterm benefits. In 1976 Chuxian Prefecture grew 1.31 million mu of green manure, but in 1980 it grew only 300,000 mu. During this same period, quantity of chemical fertilizer applied increased from 87,600 tons to 239,800 tons. Existing wastelands were quickly cleared, and

land made by filling in lakes was all planted. In this situation, how to insure that the land's fertility would not decrease with each passing year, and how to carry out a rational reversion of cultivated land to forests or fisheries to maintain the ecological balance, and such longterm measures, was a difficult problem urgently in need of study and solution.

After their longrange use and rights to farm the land, as well as their rights to farm the land as they wanted changed, the peasant's did some long-range thinking about farming the land and realized this was closely related to investment in the land. Readjustment of the land would make peasant investment in the land for which they contracted change as their rights to farm the land changed. Action to achieve ecological balance, and use of cultivated land for the building of water conservancy and other public facilities would hurt the peasants' direct interests. Under these circumstances, were the method of egalitarianism and indiscriminate transfer of resources to be applied simplistically in readjustment of the land and to solve problems in use of land for public facilities, that would either meet with peasant opposition or result in the land being farmed in a plundering fashion. It was necessary to let the peasants make longterm plans and encourage the peasants to undertake large scale, longterm investments to improve land quality. Suitable methods had to be adopted so that peasants would be compensated for the living labor and the embodied labor that they invested in improving the land. It was necessary, in addition, to induce the peasants to consider their longrange interests by growing crops that nurtured the soil and by rational crop rotation. This required corresponding economic measures as inducements.

### 3. Problems in Land Transfers

In order to fully guarantee public ownership of land, areas instituting double contracting to individual households framed regulations not allowing the transfer, rental, or sale of land, and not permitting the hiring of workers to farm it. They also took action to render assistance to hardship households. Under these circumstances instances of land transfers or hiring of workers were few and far between in Chuxian Prefecture. Comrades in the Fengyang County Policy Research Office reported that an overwhelming majority of peasant households contracting land were able to farm it themselves, but for about 2 to 3 percent of peasant households farming was difficult. The main workforce in some of these was either cadres or industrial workers; some were engaged in industrial sideline occupations and business, and some were hardship households with no able-bodied workers. How could such peasant households solve difficulties in independent farming? (1) An overwhelming majority did the work themselves, asking for help during the busy season in farming; (2) In a small number of cases, they farmed a portion of the land themselves and transferred the other part to others to work, the contracting household bearing responsibility for state procurement quotas and withholding quotas for all the contracted land. Alternatively the contracted land was farmed by someone else, the contracting household buying its grain rations at list prices and benefiting from price differences. (3) In extremely few instances, others were asked to do the

planting with the harvest reverting to the contracting household and only a portion of the grain being given as compensation to the household doing the farming. Though most of the foregoing three kinds of situations took place among relatives; nevertheless, they were fairly clearly in the nature of hiring workers.

### III. Problems of Gaps Between Poverty and Wealth.

Following double contracting to individual households, agricultural production efficiency increased remarkably, but how to avoid a gap between the poor and the rich became an important question about which everyone was concerned. Our understanding of this question is as follows:

#### 1. Extent of Peasant Household Prosperity and Differences

Following double contracting to individual households, peasant income in Chuxian Prefecture increased everywhere. Computation of earnings in terms comparable to the former portion of earnings from collective distributions showed that a commune member income of 79 yuan in 1977 increased to 103 yuan in 1980, a 30.4 percent increase (figured in terms of variable prices, the 1980 amount was 128 yuan, a 62 percent increase). If the portion of earnings derived from commune member household sideline occupations and private plots were added to this, average net income for commune members in the prefecture as a whole was about 200 yuan, an almost doubling of income. We surveyed the family livelihood of 114 peasant households. In only one such household had income declined from what it had been before double contracting to individual households. Prefecture and county policy research office comrades reported that for more than 95 percent of peasant households, earnings had increased considerably.

Comparison of differences in levels of peasant household income today with those before double contracting to individual households was instituted revealed no clear widening trend. Taking three production teams in the prefecture with high, medium, and low income levels as an example (See Table 1), the gap in income between the household with the highest income and the one with the lowest income has narrowed from what it had been before double contracting to individual households. A look at peasant household income levels shows that in Xiaogang and Luzhuang production teams, income levels for each peasant household were closer to the average income level for the team as a whole than was the case before double contracting to individual households. That there has been no clear widening of the gap between the poor and the rich results from the following reasons: Universally high enthusiasm for production; land was proportionally distributed on the basis of population, or on the basis of population and workforces, and not solely on the basis of workforces. In production, individual peasant household could act on their own initiative to make the most of strengths and avoid weaknesses; supplementary workforces in families could be used to full advantage, etc.

## 2. Peasants' Psychological Reaction to the Gap Between the Poor and the Rich

At the present time the reaction of Chuxian Prefecture peasants to the gap between the poor and the rich is not great, and much less does it pose a threat to social stability and development. The following are the reasons why:

First, peasant income has risen everywhere. Among those we surveyed, the answer from 98.6 percent was "incomes have gone up; at least everyone has food to eat. Those replying, "poor families have also increased their income; they have no cause for complaint," numbered 97.9 percent. This is a solid basis for guaranteeing unruffled peasant feelings and continuation of enthusiasm for production at a high level. For many years they have been frightfully poor, so their first concerns are food to eat and clothes to wear, and during the past 2 years everywhere they have had both. As a result, they are satisfied and are not upset at the existence of a gap between rich and poor.

Second there is no obvious expansion of the gap between the rich and the poor (See Table 1)

Third, everybody now has an opportunity to get rich. Of those surveyed, 88.2 percent replied as follows: "Both the land and the oxen to farm it have been contracted, so those with ability get rich first. No complaints." The peasants now feel that everybody now depends on his own ability and sweat, and works under generally equal production conditions. Amount of earnings depends substantially on amount of work and quality of work and not on social position or special privileges. As far as differences between one household and another in amounts of funds, and amount and quality of able-bodied workers are concerned in these circumstances, most of the peasants felt this was natural and fair.

Fourth, peasant feelings of security have increased. In places like Chuxian Prefecture, the peasants' greatest feeling of insecurity is about not having enough warm clothing to wear or enough food to eat. Double contracting to individual households very quickly solved the peasants' problems with clothing and food: consequently, at the minimum level of human needs, the peasants' feelings of security have been strengthened. In addition, the general increase in commune member income and improvement in relations between one person and another have increased possibilities for mutual cooperation among peasants in money and labor. This has further enhanced their sense of security.

Table 1. Average Income In Representative in Upper, Medium and Low Income Production Teams

Team Name	Year	Average Net Per Capita Income				Average Variation in Average Per Capita Net Income				
		Highest Household	Lowest Household	Difference Between Highest and Lowest Household	Team Average	Original Value	Converted Value	Increase As Compared with Prior to Contracting Individual Households		
		(Yuan)	(Yuan)	(Yuan)	(%) (Yuan)	(Yuan)	(Yuan)	(Yuan)	(Percent)	
Xiaogang	1977	88	6.4	81.6	1275 35	17	168	-	-	
	1980	668	168	500	298 342	110	110	-58	-345	
Hezhuang	1978	192	36	156	433 116	40	186	-	-	
	1980	1146	336	810	241 545	249	249	63	331	
Luzhuang	1980	413	117	296	253 198	58	102	-	-	
	1981	586	263	323	123 353	61	61	-41	-402	

Notes: 1. Luzhuang Team's 1981 income figures have been estimated

2. Because the average value of income for the team as a whole differed before and after contracting work tasks to individual households making comparison of average variation impossible, conversion of the average variation was done on the basis of corresponding proportions, so comparison could be made.

### 3. Necessity and Practicability of Assisting Hardship Households

Following double contracting to individual households in Chuzian Prefecture, the income of most hardship households increased, and the number of hardship households declined. Take Fuxing Commune in Laian County, for example. There the proportion of hardship households having an annual grain ration of less than 360 jin and average per capita earnings of less than 50 yuan fell from 30 percent of the total number of households in 1977 to 4.5 percent in 1980. Most of the former hardship households got out of their situation of

not having enough clothes to keep warm or enough food to eat, and most of the present hardship households have also increased their incomes. Nevertheless, some hardship households have a very hard life, and income has fallen for a very small number of hardship households. An overwhelming majority of them welcomed double contracting to individual households, but their psychological reaction to the gap between poor and rich is stronger than in the case of other peasant households.

A look at the trend of development of the gap between poor and rich shows that unless appropriate action is taken, any one of the following situations can occur: As problems of having sufficient warm clothing to wear and enough food to eat are universally solved and contracting to individual households goes on for a long period of time, the peasants will become increasingly concerned about the gap between rich and poor. Prosperous households will use the abundant funds and the fairly high production technology they have at hand to either directly or indirectly transgress the interests of hardship households. Equality of opportunity to become rich will be destroyed, and hardship households will transfer possession of their production tools or even covertly transfer land. In this way the gap between the rich and the poor will exhibit a tendency to widen becoming an element in the destruction of social order and development. For these reasons, assistance to hardship households is necessary.

The guiding idea in the work of giving assistance to hardship households in Chuxian Prefecture is "helping the poor entails helping their will, and helping their will entails helping fundamentally." By "helping will" is meant teaching those to be helped to develop the will and the courage to shake off poverty and, with appropriate outside help, to rely mostly on their own efforts to overcome hardships, increase income, and guard against developing a mentality of dependence. By "helping fundamentally" is meant helping those needing help to develop production in order to solve their problems in a fundamental way rather than simply give them relief. Of course it is also necessary to give hardship households a certain amount of help to solve their real present hardships so that they will be able to take the first step along the road to the development of production. Specific ways of doing this are as follows:

(1) Formulation of standards for "helping the poor." In general such standards should include: those who lack a principal worker, or those whose principal worker has been ill for a long time and who do not have enough income to maintain the minimum local living standard; those who have little accumulated wealth, are deeply in debt, and lack minimal implements and funds for production as well as the necessities of life; those who have sustained natural or man-made disasters and who are unable to shake off adversity through their own efforts within a short period of time; and male and female children who have not yet reached adulthood who are carrying heavy burdens and whose lives are extremely hard. Those who lack will and depend on others, or do not work and are hard up as a result should not be objects for "help to the poor" in most cases. However, they should be



helped develop will and courage. Facts should be concluded with them to guarantee production, and they should be supervised and encouraged to take the right road.

(2) Determine who is to be given "help to the poor." A thorough survey of hardship households has to be done first; and they should be registered and recorded. Then the masses should hold discussions for evaluation purposes; production brigades should investigate; communes should approve, and finally the facts should be publicly posted. Every effort should be made to avoid omissions so that the masses will not be dissatisfied and so benefits from "help to the poor" will not be impaired.

(3) Support with funds. In general goods, not money, should be given. Most of the things given should be those that can be used in agricultural sideline production such as chemical fertilizer, seeds, pesticides, as well as piglets and chicks. Second should be clothing and home building materials for use in daily life.

(4) Help with workers and skills (both for production and for daily life). Generally such help should be given by setting up "mass help teams." Laian County also used a system whereby cadres were made responsible for households in "helping the poor." Cadres above the County Science Bureau level and most cadres in districts, communes, and production brigades set up associations of households responsible for helping the objects of the "helping the poor" effort to formulate measures for throwing off their poverty and to help them plan production and daily living with someone being responsible for everything.

(5) Priority care in production conditions. This includes priority in contracting land, for example, priority in providing for use of draft animals, farm implements, and machines; priority in water supply; priority in supply of chemical fertilizer, pesticides, and superior seeds, etc.

(6) Lightening or exemption from responsibilities in many ways. This includes production team reduction or exemption from withholding quotas; commune and brigade enterprises reduction or exemption of processing fees for grain and edible oil; medical department reduction or exemption from some medical fees; water conservancy department reduction or exemption of fees for water; education department reduction or exemption from various school fees; priority supply of goods at list price by departments concerned, etc. However, opinions vary on this.

(7) Regular inspection of results from "helping the poor." From the foregoing specific measures may be seen that "help to the poor" differs from simple social relief. It is not simply bringing income to a common level, and much less is it robbing Peter to pay Paul, but rather is an effort to improve the relatively poor production conditions and individual capabilities of hardship households so that they will be able to use on generally equal terms with others the opportunities to become rich that they

are unable to use to the full by themselves, and to actively engage in agricultural sideline production, thereby increasing their own income levels and getting rid of poverty. Therefore, correct "helping the poor" neither leads to egalitarianism causing production efficiency to decline, nor does it widen the gap between rich and poor thereby impairing social order and economic development.

#### IV. Direction of Flow of Workforces and Funds

Following double contracting to individual households in Chuxian Prefecture, peasant investment of effective manpower greatly increased and ineffective manpower greatly declined. The amount of funds peasants possessed increased. A new trend toward excess manpower and funds appeared.

##### 1. Increase in Surplus Rural Labor

As the efficiency of agricultural production increases and the working population increases, a surplus of rural workforces has become apparent. This surplus is both a year round one and a seasonal one. It has been calculated that about 20 percent of Chuxian Prefecture's agricultural workforce (or 220,000 people) could leave the land all year round, and the number is continuing to grow. This is because of the following:

First, though the speed of population increase may possibly slack, the speed of increase in the workforce is still rapid. About one-half of Chuxian Prefecture's 3.34 million population is under 19 years of age. In any given year in the future, the population coming of working age far exceeds the population that is retiring. If ages 18 to 60 are considered working ages, the prefecture's working age population will increase by 46 percent over the next 10 years, and by 62 percent during the next 18 years.

Second, the cultivated land area is shrinking. In 1980 the amount of cultivated land per capita of the agricultural workforce averaged 5.41 mu, 43 percent less than the 9.54 mu of 1952 for an average annual incremental decline of 2.01 percent. As a result of increase in the working age population, even if the cultivated land area shrinks no further, it is estimated that within the next 18 years, the amount of cultivated land per capita of the workforce will be 38 percent less than it is today, for an average annual 2.65 percent incremental decrease, which is faster than the incremental decrease of the past 28 years.

Therefore, if no major changes take place in the current rural employment structure, the surplus workforce will double within 5 years after the beginning of the 1980's, and will triple within 10 years. It will be 40 percent of the total agricultural workforce at the time. It will not be until the 1990's that the speed of increase in the surplus workforce will slacken (See Table 2).

If one says that the present 220,000 surplus rural workforce has not yet caused any obvious bad effect, the 470,000 of 5 years hence or the 710,000

of 10 years hence will exert considerable pressure on society. To rely on nearby cities to take that much surplus workforce in the future is very difficult to imagine. Therefore, various preparations must be made to transfer agricultural workforces as soon as possible.

Table 2. Change Trends in Chuxian Prefecture's Surplus Rural Workforces

Year	Agricultural Workforce (10,000)	Average Amount of Cultivated Land Per Capita of Workforce	Surplus Quantity (10,000)	Rural Workforce Increase From 1980 (%)	Percent of Agri- cultural Work- force
1980	116.9	5.35	23.3	--	19.9
1985	143.4	4.36	47.0	101.7	32.8
1990	170.2	3.67	71.0	204.7	41.7
1995	185.2	3.38	84.4	262.2	45.6
1998	189.7	3.30	88.4	279.4	46.6

## 2. Improvement in Rural Capital Situation

Production cannot develop with a workforce alone. For many years a vicious cycle has existed in rural villages of "lack of investment--slow development of production--low labor productivity rate--slow accumulation of capital--lack of investment." The party's rural economic policies have caused Chuxian Prefecture's agricultural production to begin to break this vicious cycle, with the result that the rural capital shortage situation has taken a fairly clear turn for the better. This has increased investment in agricultural production and brought the prospect of fine development.

Formerly the rural collective economy made distributions only after having deducted production expenses, and commune member earnings were used substantially for consumption. Following the contracting of work tasks to individual households, both agricultural production expenses and investment in fixed assets were paid for largely out of the earnings of peasant households themselves; peasant income was no longer consumption funds. Survey showed the ratio between peasant household daily living payments and production payments to be basically 30 percent to 70 percent. Among production type payments, agricultural production expenses accounted for more than 60 percent, and production of fixed assets, industrial sideline occupation raw materials, and other production type payments each amounted to more than 10 percent. Among daily living expenses, food accounted for more than 50 percent; clothing, housing, and consumption goods each accounted for more than 10 percent; and other expenditures were less than 10 percent. These circumstances should be given attention when formulating rural economic policies.

Following double contracting to individual households, because the peasants' personal welfare was closely linked to results in agricultural production, enthusiasm for production increased, voluntary contraction in the ratio of spending occurred, and increased investment in production became the trend. During the past 3 years the Chuxian Prefecture supply and marketing system's sales figures for the means of livelihood have increased at a rate of less than 10 percent, but its sales figures for the means of agricultural production have increased year after year by more than 20 percent, including a 29 percent increase in 1980.

Today a considerable amount of currency that can be used for the purchase of things is in the hands of the peasants. How to make this money that is waiting to be spent play a constructive role in development of the national economy without impacting on the market is a problem requiring meticulous study and conscientious treatment. Just what the prospects and results are for peasant pooling of funds for partnership operations and of encouragement to peasants to invest in the collective or even in state-owned enterprises should be thoroughly explored.

It has to be appreciated that rural villages have just now solved problems of sufficient clothing to keep warm and enough food to eat, that they have just begun to accumulate some funds, and that development of agricultural production urgently requires funds. Investment capabilities and needs for expansion of reproduction are far apart. Under these circumstances how to induce the peasants to make rational use of these funds holds very great significance for China's rural development. It is necessary to proceed on the basis of gradual increase in peasant spending on living to planned encouragement and guidance to peasants for productive investment. Attention should be directed to avoidance of premature spending beyond levels of production. For example, for the time being there should be no publicizing or encouragement to peasants to travel to distant places.

3. Within the short term, emphasis should be placed on development of economic diversification on a family scale.

In a situation of many laborers and little capital, how can surplus rural workforces and limited capital be put to work in a fairly rational way. How much capital is required per worker in the production process is a major indicator in judging the capabilities of various sectors of the rural economy to absorb the surplus workforce. The experiences of Quanjiao County show that the amount of capital required per workers in a commune or brigade enterprise averages 3.8 times that for workers engaged in economic diversification on a family scale. The amount of fixed assets used by the former is 8.1 times that of the latter. For every 10,000 yuan in fixed assets, 10 people can be placed in a commune or brigade enterprise. Used in economic diversification on a family scale, 81 people can be placed. In addition, in overall terms, speed of accumulation of capital from economic diversification on a family scale is faster than for commune and brigade

enterprises. Calculations show that for every 100 yuan of capital invested in Quanjiao County, commune and brigade enterprises could produce 71.59 yuan net income per year, while family scale economic diversification could produce 233.33 yuan of net income, which was 3.3 times the former. Thus, the rate of productivity of the latter's fixed assets was 4.1 times that of the former.

Formerly under circumstances of limited peasant operation of industrial sideline occupations and in which industrial and agricultural product comparative prices were inequitable, commune and brigade industrial enterprises played an active role in solving the problem of rural capital shortage. In the future, with readjustment of the national economy and changes in rural production relationships, existing commune and brigade industrial enterprises will have to try to develop in the midst of readjustment and do the necessary restructuring to meet changes in rural economic life. In their operations, they will have to stress production of products for which raw materials are plentiful, energy consumption small, and for which markets can be found. Examples are farm implements and building materials that are urgently needed in rural villages now. These should be underscored. However, in order to make the capital in peasant hands achieve greater use and make peasant enthusiasm for productive activities greater, as far as Chuxian Prefecture is concerned, for the short term the emphasis should be on development of family scale economic diversification. Not only does family scale economic diversification take little capital, but for the same amount of capital the rate of production is vastly higher than that of commune and brigade enterprises, and for investment of the same amount of capital in families, a greater amount of surplus workforces can be absorbed. Therefore, directing the flow of labor and capital to family scale economic diversification great significance as a way of solving the problem of excess rural labor, making full use of the role of limited capital, and increasing results in the macro-economy. On this basis, large numbers of peasant households with double occupations will come into being, and there will be increasing differentiation of specialized households to change the trend of decline in the per capita amount of cultivated land.

Under existing market control circumstances, price policies play a substantial guiding role in the flow of rural labor and capital. In formulating price policies, the state should make an all-around evaluation of production potential, market potential, and of the consequences of labor and capital flow.

Right now a certain blindness exists in the movement of labor and capital. In some areas, too many industrial and commercial service industries are being operated in excess of actual needs, while some matters of economic diversification holding prospects do not develop as they should for lack of sufficient support. Some places having no assurance of fuel supplies buy trucks and tractors for agricultural use, and in some peasant households there are symptoms of lack of concern for continued development of grain production. In handling these matters, leadership departments should use economic

methods, legal methods, and necessary administrative methods to intervene and give direction.

## V. Prospects For Cooperative Association

During the last 2 years various kinds and forms of cooperative associations have come into being in the development of the rural economy. We also observed and studied the present state and prospects for these new cooperative association forms.

### 1. Present status of cooperative association

According to incomplete statistics from Chuxian Prefecture dated May 1981 in addition to a large amount of seasonal and temporary simple cooperation among peasant households, there were a total of 6,114 fairly stable economically associated groups participated in by 26,865 households on 14 kinds of undertakings throughout the prefecture. This was 4.5 percent of the total number of peasant households. Directly engaged in associated undertakings were 23,441 people or 2.1 percent of the prefecture's total workforce, an average of 4.4 households per associated group, with 3.8 people per household participating in endeavors directly.

This new associated groups are distributed largely in the three counties of Dingyuan, Fengyang, and Jiashan, which instituted the contracting of sole responsibility for work tasks to households fairly early, where the foundation for collective industrial sideline occupations is shaky, where state requisition base figures are fairly low, and where capital has accumulated fairly rapidly. Statistical data from Jiashan County shows that the speed of development of associated groups has been fairly rapid as follows: As of April 1981, associated groups numbered 1,078. By August the number had grown to 3,909 for a 262 percent increase. The 4,415 participating households grew to 21,411, a 385 percent increase and 24 percent of the county's total number of peasant households.

The specific form of Chuxian Prefecture's cooperative and associated groups may be divided into three kinds in terms of the relative degree of their agriculture in a narrow sense. The first kind is cooperation and association directly in the production process in a narrow sense and in economic diversification, which accounts for 91.7 percent of all households in associated groups. The second kind is associated groups in manufacturing industries and doing preliminary processing of agricultural products, which account for 7.2 percent of the total number of associated group peasant households. The third kind is associated groups in business and the service trades, which number 1.1 percent of all peasant households in associated groups. Distribution of already formed associated economic groups in 23 different kinds of activities is shown in Table 3.

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The need for cooperation and association was born, first of all, in the direct production process in agriculture after which it grew into associated groups in industrial sideline occupations, in business, and in the service trades.

## 2. Several Characteristics of Cooperation and Association

First, the new associated groups fundamentally have to do with association before farming and after farming, as well as to the simple cooperation occasioned by the seasonality and sudden needs of farming itself.

Second, most of the new associated groups have taken the form of being loosely affiliated but not combined. Each participant does an independent economic accounting, becomes a shareholder voluntarily, withdraws voluntarily, and individual households may be a part of several associated groups at the same time. At the time they are set up, either a number of people equivalent to the number of shares bought are employed, or shares are bought according to the amount of funds available and the number of people to be employed is set according to production needs. Mostly distribution is done in accordance with work, bonus in accordance with the amount of shares purchased being ancillary.

Third, currently these associated groups are still in their formative stages. Concentration of able farmers in the farming industry and concentration of skilled craftsmen in industrial sideline industries is only just beginning to appear, while economic association of specialized peasant households or economic association based on specialized division of labor is a rarity in actual rural economic life.

The reasons for the rapid development of new economic association in Chuxian Prefecture and the reasons they bear on such a wide range of activities are as follows:

First is liberalization of policies and the peasants having self-determination. Not only have restrictions on private individuals not being permitted to buy machinery been lifted, but support has been given such purchases by installment plan buying. Not only are peasants permitted to go in for economic diversification, but they are allowed to open retail shops and run industrial plants. Only in this way has it been possible for new economic associations to come into being in Chuxian Prefecture.

Second is the existence of surplus labor and idle capital. Following the contracting of full responsibility for work tasks to individual households, the trend toward change in the structure of the rural workforce was one of "three increases and three decreases," by which is meant an increase in the amount of effective labor, and a decrease in the amount of ineffective labor; an increase in the amount of labor employed in multiple industries, and a decrease in the amount of labor engaged in agriculture; an increase



in auxiliary labor, and a decrease in labor by women. The labor surplus in agriculture that had been covered up by the "great hullabaloo," was brought out into the open. Take Kaocheng Commune in Fengyang County, where there are a fairly large number of economically associated groups, for example. Kaocheng Commune has a workforce totaling 7,200 people, each member of the workforce being responsible for farming an average of 4.4 mu. According to calculations we made about the number of workers needed to farm various crops, 2,700 workers would be needed for the somewhat more than 30,000 mu in the commune. Calculations made from a representative sampling of households showed household sideline occupations requiring a workforce of 1,200 people, so the surplus workforce amounted to more than 45 percent. The surplus labor and idle capital had to join together for development in depth and in breadth.

Third is changes in market conditions. With development of production and increase in income, gradual increase occurred in peasant demands for the means of livelihood, the means of consumption, and for services in their daily lives. However, on the other hand, some commune and brigade enterprises in the existing collective economy that had a shaky foundation, a bad attitude toward service, and poor results from their operations, became mired in a state of paralysis and stagnation one after another. Their supply of the means of production was inadequate, channels for the flow of materials became clogged, and sharp conflicts between supply and demand occurred. In such a situation, peasant household investment of funds had an extremely powerful attraction. The peasants hoped to rely on their own strength to bring about many channels of flow for materials and to blaze new production trails.

### 3. Socio-economic Results

Comrades in Chuxian Prefecture said that the new economic association groups made the most of strengths in contracting full responsibility for completion of work tasks to individual households and made up for shortcomings in such contracting. This made sense. With the establishment of associated groups by contract households, this form of organization that helped development of production was better able to effectively increase the socio-economic benefits of agriculture.

First, it brought into play the initiative of both individuals and collectives in the farming industry. Formerly when the "great hullabaloo" was practiced in agricultural production, the relationship between the labor contributions of commune members and the remuneration of labor was expressed through the medium of workpoints. However, practice has shown that the workpoint system cannot effectively put into effect the principle of distributions according to work. On the one hand this system hurt individual commune member enthusiasm for labor, and it also did not allow productivity from cooperative production to develop. The responsibility system of contracting full responsibility for completion of work tasks to individual households effectively solved the first of these two problems;

nevertheless, it also gave rise to farming by independent households and further development of conflicts in production. Economic association solved these conflicts. While maintaining the responsibility system of contracting full responsibility for task completion to individual households, it brought about working in cooperation, expansion of space for reproduction, shortening of work hours, and a saving in both living labor and embodied labor. Its basic principle is decentralization of whatever should be decentralized, and centralization of whatever should be centralized. An example is the associated tractor team in Taiping Commune, Jiashan County, which instituted cooperation in the planting, tending, and harvesting links of grain production; and used machines more beneficially than had been possible by individual households in the production links of plowing, harrowing, hauling, and threshing. These methods were hailed by all the peasants.

Second, the new economic association helps both skilled farmers and skilled craftsmen make the most of their technical specialities and to gradually move from the foundation of contracting full responsibility for work task completion to individual households toward specialized production. In the former collective economy, as a result of egalitarianism and not being able to do work suited to one's abilities, the special skills of people were held in check, while at the same time some specialized division of labor became a privilege. Following the contracting of full task completion to individual households and the emergence of economically associated groups, an effective way in which to solve the foregoing problems was provided. In the production of tobacco, for instance, where it was not economical for individual households to set up curing rooms, when several households cooperated, the time for growing of seedlings, tending them and curing the tobacco would be largely identical. In this way, those skilled in the growing of tobacco would constitute the nucleus in getting together various households in association. Skilled tobacco grower Fu Ronghuai [0265 3837 2037] of Qiandong Production Team in Qiaotou Commune, Jiashan County had an annual income of 260 yuan solely from the growing of tobacco seedlings for three production teams. In growing the seedlings, he put the seeds that had been soaked into plastic bags, and when he went into the fields to work, he hung them on his clothing next to his skin, and when he slept, he put them inside the bed clothes until they had all sprouted. After planting them, he carefully tended them.

Third, the new economic association provided a workable organization form whereby rational arrangements could be made for use of manpower, capital, and natural resources. The contracting of full responsibility for work task completion to individual households had tapped production potential and steadily brought into being surplus labor and idle capital. How to make the best use of them and use them in expansion of agricultural reproduction and rural economic construction became a great problem. For example, in Kaocheng Commune some peasants had money with nothing to spend it on, so they frequented taverns, got together to gamble, and even made usurious loans, or went by train to Pangfou to carouse. After associated groups were set up, the considerable amount of idle funds in the hands of peasants were combined with the surplus labor and invested in expansion of reproduction.

Today, 85 of the 183 peasant households in Kaocheng Commune jointly operate integrated industrial and business associated groups for processing of grain and edible oil, and to do electric welding. They have purchased 47 tractors for a total investment of 188,700 yuan. Associations of peasant households in Taiping Commune invested 402,200 yuan in the purchase of tractors alone. This has not only converted dead money into live money, but large amounts of surplus labor have also been soaked up by these associated groups.

Fourth, the new economic association has promoted readjustment of the rural economic structure and has provided a stepping stone for the transition of the rural economy from what is substantially self-sufficiency production to a commodity economy. The former collective economy was engaged throughout in substantially the same kind of activities, and there was little division of labor for production of various kinds. In addition, workers within the collective economy were restricted to relatively unchanging work hours. For example carpenters and blacksmiths in production teams were generally responsible only for repair of the production team's farm tools and spent the rest of their time farming. Such an economic structure, whose horizons were the production team, was totally demolished by the contracting of full responsibility for task completion to individual households, and the new economic association provided an embryonic form for development of a new economic structure.

Fifth, the new economic association posed new demands for reform of the rural economic structure. Responsibility systems linked to production are a starting point for reform of the rural economy, and the birth of new economic association has strengthened this tendency. In Qiaotou Commune, for instance, there are two grain and cotton processing plants, one of which is operated jointly by peasant households and one of which is commune operated. The processing plant run jointly by peasant households does not have great resources by any means, but it stresses economic results, flexible methods, and thoughtful service, and it cares a great deal about its reputation. As a result, it has become dominant in competition with the commune run plant, and customers flock to its door. Though the commune run plant has better buildings and equipment than the plant run jointly by peasant households, it had to stop work for 2 months because of poor management, decline in earnings, and inability to pay wages. Finally it had to cut half of its employees and change from eating out of a large common pot to a system of contracting full responsibility for work task completion. This showed us that in reform of the rural economy it is possible to use a minimal social shock to gain very great results and, without directly changing the old system in name, to bring about gradual evolution of its actual content. This is advantageous, of course, in reform.

Double contracting to individual households is a basic condition for the existence and development of the new cooperation and association. For a substantially long period of time, the responsibility system of double contracting to households must remain stable and not be lightly changed. Any of the production links in farm that can be done independently by peasant

households can also use cooperation and association, with peasants themselves feeling their way toward solutions in practice, the principles of voluntary participation for mutual benefit, and centralizing whatever lends itself to centralization while decentralizing whatever lends itself to decentralized being followed. There should be no artificial organization of cooperation and association, and care should be taken not to start a movement on a grand and spectacular scale, rushing headlong into rash action only to break up in a hubbub.

One can also not take an entirely laissez-faire attitude toward peasant cooperation and associated groups, but rather should set up statistical and supervisory systems, and use economic methods to put peasant associated groups on the path toward being a part of state plan. Financial departments should set up bank accounts for them, make loans to them, and take in their savings. Vocational departments concerned should help them set up responsibility systems and contract systems in cooperation, train management and technically skilled personnel in an organized fashion, gradually improve the cultural level of participants, and train cultured businessmen. Distinctions should be made in taxation, low profits being taxed low and high profits being taxed high. For associated groups having exceptionally high profits, accumulative total taxes should be levied, but this should be done loosely at first with tightening taking place later on, both so that the associated group can make a profit and so that the state will gain a definite economic benefit.

## VI. Establishing an Equitable Economic Functional Structure

Rural establishment of a socialist collective economy was a correct choice made by the masses of Chinese peasants under leadership of the party. Following establishment of the collective economy how to put it on the track of a management system suited to circumstances in China has been a process requiring steady practice. For a long period of time the system whereby politics and communes have been linked has resulted in the management function in China's rural economy being overly centralized. This has inhibited giving full play to the enthusiasm of the peasant masses and of rural cadres, and abuses have been extremely obvious. But institution of production responsibility systems has led to thoroughgoing changes in the rural management system. We devoted a lot of study and attention to these changes in Chuxian Prefecture.

### 1. Peasant Households Have Taken on Some Management Functions

The trend in rural Chuxian Prefecture that has aroused most attention during the past 2 years has been increase in the role of peasants in economic life. A considerable part of the function of managing the collective economy has been taken over by peasant households. These functions consist largely of the following:

First, direct organization of production and labor by contracts. This has included the following: arranging for the sequence of crops to be grown on contracted land; preparations for production (machine and draft animal power, seeds, fertilizer, pesticides); decisions about and implementation of technical measures to increase production; allocation of household workforces to plowing, planting, tending, and harvesting; maintenance and use of machines and equipment; exchange of labor, etc. The situation in which a small number of cadres were relied upon to get planting and harvesting underway every season is over. Farm work is as tiring as ever, but life has a rhythm. By effectively using their sparetime, peasants are able to manage their household affairs more smoothly than formerly, go to market or see a play, visit relatives and call on friends, and study cultural knowledge and farming techniques. This helps greatly in improving reproduction and the quality of rural life. The tremendous all-around increase in agricultural production throughout the prefecture shows that the peasant household take over of these functions makes sense and is effective.

Second is accumulations. Accumulations that peasants have turned over to the collective are greater than in previous years. At the same time peasant households are engaged in accumulating themselves. In 1980, peasants in the prefecture put out their own money to buy 126 large and medium size tractors, 1,933 hand held tractors, 1,926 processing machines, 18 farm motor vehicles, and 25,298 plow oxen. In the same year production funds increased by 23 percent over the previous year, and this could not but greatly increase agricultural reproduction capacity. At the same time, peasant households invested funds to buy shares for participation in commune and brigade enterprise reproduction.

Third is credit. Banks are changing to make households the unit to which they grant credit. In Tianchang County, 24,000 households have set up credit accounts. Agricultural banks in all counties report that peasant household creditworthiness is much better than production team's had been. Dingyuan County formerly had 500,000 to 700,000 yuan in unrecoverable loans annually. In 1980 1.8 million yuan of loans were issued to peasant households and 1.87 million recovered the same year (700,000 yuan being old loans). Last year Jiashan County overfulfilled by 14 percent its loan repayment plan.

Fourth is distribution and supervision. The former overconcentration of the management system meant that a small number of people had too much power while the democratic rights of the peasant masses and lower level cadres were comparatively few. Some of the apathy about work of the peasant masses resulted from protest against this state of affairs. Moreover, the poverty ensuing from apathy about work made eating more and consuming more increasingly rampant in a vicious cycle. Today, once a peasant household has turned over to the state the amounts stipulated in contract agreements, all the remainder is its own. Thus, not only is the portion of total earnings that the peasants get greater, but the peasants can refuse to pay

for unreasonable expenditures and prevent cadres from spending freely and wasting. This protects the fruits of the peasants' labors, protects collective property, and protects cadres.

As the economy develops, functions taken over by peasant households will also undergo change and new combinations will be formed. (1) Some peasant households already show a tendency to develop into specialized households. Survey of 20 different kinds of communes in the prefecture shows a 24.1 percent increase in 1980 as compared with the year before in income from peasant family sideline occupations. Quite a few peasant households actively farm economic crops from which earnings are relatively high (oil-bearing crops, mat grass, peppermint, mulberry, and hemp), engage in the breeding industry (cattle, sheep, hogs, poultry, rabbits, bees, fish, and silkworms), processing, hauling, small business, weaving, and services. The first signs of specialized division of labor have also begun to appear among peasant households. Some things requiring a fairly large amount of skill such as breeding, growing of seedlings, curing of tobacco, and the five rural crafts [masonry, carpentry, pastering, bricklaying, and bamboo work] have already begun to be taken over as specialities by some households. These changes will further expand the scope of peasant household operations, and will make for diversification a closer relationship among rural households and the entire society. (2) A large number of peasant households working on the principle of voluntary participation for mutual benefit have teamed up to contract commune and brigade enterprises such as individual peasant households would not be able to manage alone. With the surplus labor in households and accumulations of capital, some associated groups for which commune members have themselves put up the capital have come into being. Thus, differing forms of cooperative organizations are gradually becoming new economically beneficial entities. Not only do they engage in complex associations and exchanges with peasant households and other economic units, but also generate and produce within associated groups plans, management, distribution, accumulation and such new functions. Though peasant household association is embryonic today, it holds prospects for greater capacity and expanded development.

## 2. Necessary Collective Organization Management Function

After some economic functions have been transferred to peasant households, will the collective economic organization still have to be responsible for necessary economic functions? The answer is affirmative.

Existence of the collective economy is an objective necessity for development of the economy. A look at Chuxian Prefecture shows, first of all, an annual flow between cities and countryside of several hundred million yuan worth of industrial and agricultural products. Only a collective economic organization is able to take on the exchange of goods with centralized industries and cities.

Secondly, that portion of agricultural skills that cannot be mastered and spread through the accumulation of experiences of individual peasant households is on the increase. More and more peasant households must obtain information about agricultural techniques. Only by banding together can the 600,000 peasant households in the prefecture obtain technical information smoothly. This accounts for the emergence of a flourishing of all levels of scientific farming organizations, scientific technique responsibility systems, model households for farming techniques, and peasant scientific societies.

Next, some regulatory functions related to the welfare of peasant households themselves such as "assistance to the poor," handling of quarrels about water use, readjustment of the land, etc., obviously require a structure and organization responsible for handling.

Finally, peasant households may not give serious attention to matters such as population increase, ecological balance, restrictions on use of cultivated land, things that pertain to macro-economic benefits, things that relate to the long range interests of all the people including peasants, and things in economic life that may frequently conflict with the immediate interests of the peasants. One could not expect that such matters would be managed entirely by peasant households themselves.

The foregoing several matters occur mostly in the indirect economic process. Even in the direct production realm, peasant households cannot take responsibility for all activities. For some matters, neither individual peasant households nor present associated groups of peasants have the strength to undertake. This includes things such as emergency resistance to disasters, construction of fairly large water conservancy projects, large scale native handicraft trade, etc. In some cases it does not pay for individual peasant households to do things; only with organization can they be profitably carried out, and this requires that the collective economy take responsibility.

All this has determined that even in Chuxian Prefecture, which has instituted large scale contracting of full responsibility for work tasks to individual households, the collective economic organization has not and cannot transfer to peasant households all of its economic functions. What has happened here has been transfer of only a portion of economic functions. To a fairly large extent, production policy decisions, operating strategies, and accounting continue to be the responsibility of the collective economic organization.

In addition, during the past more than 20 years both common property has been accumulated and common debts incurred. The two are a material bond that binds peasant households together.

All these connect and reflect the stratification and diversity of rural economic relationships. Today in Chuxian Prefecture, there are four major

strata: (1) peasant households; (2) associated peasant entities; (3) state-owned or commune and brigade operated economic organizations; and (4) commune and brigade organizations directly interlinked with state organizations. No matter how large a portion of economic functions peasant households take over, they are still linked in these ways. All these links have as a premise the public ownership of land; all take place under guidance of state plans; and all are under the leadership of the party. Consequently, the sum total of these links comprise the existing socialist economic relationships of China's rural villages.

### 3. On the Economic Functional Structure

Practice has brought about an economic functional structure suited to circumstances in China's rural villages. Individual economic functions are largely undertaken by peasant households, peasant associated groups, communes and brigades, and the state in rural economic organizations. Through the establishment of individual functional organic links, coordination of the welfare of the country, the collective, and the peasants is realized.

In a certain sense, rural organizational problems are problems in establishment of an equitable functional structure.

Proceeding from the existing system and acting to depart from past practice whereby a small number of people monopolized economic functions, transferring to peasant households those things that can truly be undertaken by peasant households while having existing commune and brigade organizations more effectively undertake to carry out the remaining portion for a gradual change in the old structure and formation of a new structure is a path that can be taken for reform of China's rural system.

The problem facing Chuxian Prefecture right now is that once some economic functions have been effectively turned over to peasant households, how to take care of the other functions that peasant households are unable to be responsible for. Unless all strata and all parts of economic functions are well coordinated, the microscopic benefits already gained may be offset by the macroscopic ones. Therefore, following double contracting to individual households, all socio-economic management work has to be done truly well.

### VII. Status of Rural Cadres

In China the job of managing the rural economy is largely the responsibility of commune and brigade cadres. Chuxian Prefecture has more than 83,000 commune and brigade cadres today. The prefecture, with a 2.95 million population or 604,000 peasant households engaged in agriculture has an average of one cadre per 35.2 people or 7.2 households. This cadre corps plays a particularly important role in protecting the fruits of rural economic reforms and in advancing its further development.



## 1. Rural Cadre Earnings

We surveyed the changed situation in economic income for 54 commune and brigade cadre households at different economic levels in Dingyuan, Fengyang, Jiashan, and Quanjiao counties, the results of which showed the following:

Average income for 35 commune cadre households as figured on the comparable portion of former collective distributions showed an increase from the 38.96 yuan prior to double contracting to individual households to 114.24 yuan in 1980, a 20.91 percent increase (not including individual cadre income from wages). The aforestated income for 12 production brigade cadre households rose from an average 64.87 yuan per capital to 171.24 yuan, a 163.97 percent increase.

The average per capita 295.50 yuan subsidy that production brigade cadres received and the 62.60 yuan that production team cadres received constitutes the current [character mission] level of rural cadre subsidies. Looked at in terms of the extent of income increases, for the prefecture as a whole average per capita income in 1980 was 56.1 percent higher than before double contacting to individual households. In the four aforementioned counties the extent of increase in per capita income was lower than the extent of increase in average per capita income in 54 cadre households. The reasons for the faster increase in commune and brigade cadre economic income were as follows: (1) Vastly increased amount of labor invested. Today cadres have really "dropped from the embankments between fields into the fields themselves" where they really work in earnest. Most production brigade and production team cadres put in 220 - 330 working days a year. (2) Cadres conduct liason over a wide area; they are well-informed; and they possess fairly strong administrative skills. (3) In the use of production conditions such as use of plow oxen, use of water, purchase of chemical fertilizers, making loans, and getting workers to help, they provide real services. For all these reasons, the double contracting to individual households rapidly turned into economic income for cadres.

For this reason, not only did double contracting to individual households cause no drastic impairment of commune and brigade cadre households, but rather they benefitted from double contracting to individual households. This has been a basic reason why the broad masses of cadres have adopted a positive and active attitude toward promotion of responsibility systems (including cadre personal responsibility systems), and it has also been an important experience whereby Chuxian Prefecture leaders have benefitted and double contracting to households has achieved remarkable results.

## 2. Quality of Rural Cadres

The above circumstances is not to say by any means that the state of ideology and work of the cadre corps already meets requirements following establishment of responsibility systems. After double contracting to individual

households had been practiced for several years, in particular, numerous new problems that had never before been encountered cropped up in rural villages, and grassroots level rural cadres were by no means able to solve these problems very well. This gave rise to the unsuitability of cadre quality. In Jiashan County a commune secretary said, "Today minds are a little blank; work is a little lax; and numerous problems cannot be understood." According to a survey done by the Prefecture CPC Committee Organization Department of 68 committee members of a commune CPC Committee and 209 branch committee members of 41 production brigades, incompetent leaders at the two levels numbered 17.6 and 18.3 percents respectively, and those who did not know their jobs well amounted to 13.2 and 9.6 percent respectively.

Unsuitable cadre quality is harder to overcome than political opposition attitudes. This is because quality of management cadres is formed under certain historical conditions. Rural cultural levels in China are backward, and the "large in size and collective in nature system" [of communes], leftist errors, and the proliferation of political campaigns have all been bad for improvement in cadre management levels. Today when it is both necessary and possible to improve the quality of rural cadres, efforts are limited by the age and cultural level of these cadres. We compiled statistics on 11 communes in five counties and the organization departments of the Jiashan and Fengyang county CPC committees compiled statistics on 5,052 commune and brigade cadres in 80 communes, which found 9.7 percent to be illiterate, 50 percent to have a primary school education, and only 7 percent to have a higher than senior middle school cultural level. Those above 45 years old numbered 27.3 percent, and those who served as cadres during the period of land reform and the founding of cooperatives numbered 32.9 percent. The old age and low cultural level of rural grassroots cadres is striking. The cultural level of first tier commune cadres is fairly high (71.7 percent above the junior middle school level), but they tend to be old (51.3 percent over age 45). By comparison, production brigade and production team cadres are in the prime of life (78.3 percent being below age 45, 44.95 percent of these being under age 35), but their cultural level tends to be low (an illiteracy rate of 11.8 percent and 55 percent having only a primary school education); 66.8 percent of cadres became cadres during the "four clean-ups movement" [the period 1963 - 1966], and during the Great Cultural Revolution, and their cultural level is slightly higher and their ages slightly younger. However, the historical period in which they came to maturity was not conducive to formation of good quality.

### 3. Need for Relative Stability of Rural Cadre Corps

Is it possible to make large scale replacements of the existing cadre corps? In order to answer this question, we observed and studied how those with organizational ability in rural villages emerge, i.e., those with possibilities for replacing the present cadre corps.

First the number of cadres nationally who want to become commune cadres is extremely small. University and technical middle school graduates assigned

to communes are even rarer birds, and most of them are discontent. Ability to come up from below is limited by city and town residence requirements; even if a person is able to transfer his residence registration to a city or a town, it is difficult for his family to do so. Tianchang County is able to change the household registration to cities and towns of only 40 to 50 people a year, but there are more than 500 applicants.

Second, production brigade and production team cadres are all locally produced, and rarely are exchanges between one place and another made. Their successors can only be local peasants. Following double contracting to individual households, peasant welfare became linked to household farming of contracted land, and the interest of young, strong peasants in the study of technology and in undertaking economic diversification became very great. But desires to become cadres to manage joint undertakings declined. Cadre "seedlings" that had been selected were difficult to promote to positions of leadership. When some "seedlings" saw their prospective "cultivators," they fled as far as they could go. In addition, almost all formerly chosen cadres came from among the activists in various campaigns, and now that there are no more campaigns how to spot and train peasants with organizational abilities for economic activities is a long way from being worked up into a method. The situation today is one of it being easy to issue commands to leave at once, but summoning return is difficult.

Third, within the cooperative and associated peasant groups it is possible to bring to maturation management cadres possessed of new qualities. However, this process, like the development of associated groups, requires a long time. Jiashan County is the place where associated peasant groups have developed fastest, yet the average scale of associated groups is only four to seven households. This shows that the organizational management work of associated groups is still fairly simple. In some fairly large scale economic contracting groups, collective enterprises, and trade warehouse, leaders are either present cadres or past cadres. In Lianbu Commune in Dingyuan County, the director of a tea farm jointly contracted by 24 households was a "company commander" in a commune during the militarization period of 1958. Key personnel in the commune trade warehouse were accountants during the time of cooperativization. The Gaogang Production Brigade Phosphate Fertilizer Plant manager was a former production team head. The director of the Nianjiagang Commune trade warehouse is a production brigade party branch secretary transferred by the commune. The manager of the integrated agricultural, industrial, and commercial company of Kaocheng Commune in Fengyang County is a CPC committee secretary in the same commune. This shows us that the source of new quality management personnel can only be principally from the existing cadre corps.

Facts have shown that with the institution of double contracting to individual households, fairly rapid growth took place in rural personnel versed in single kinds of work of a technical nature that was small in scale, but that it has been extraordinarily difficult to get people who are able to

undertake comprehensive, fairly complicated organizational management work. Therefore, full use must be made of the favorable conditions created by peasants currently taking over some economic functions to reduce the overall management workload and train cadres, raise their economic management levels, and continuously bring in new blood. There is no other choice. Any unrealistic evaluations, decisions, and policies in this regard can produce an unfavorable impact on further development of the rural situation.

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CSO: 4007/7

PLANNING EMPHASIZED TO AVOID GLUTS, SHORTAGES IN LIVE HOG MARKETING

Beijing ZHONGGUO NONGMIN BAO in Chinese 26 Sep 82 p 1

[Article: "Improve Planned Marketing of Live Hogs in an Effort To Solve Peasant Difficulties in Selling Hogs"]

[Text] Frequently imbalance occurs in market supply and demand for live hog production. By this is meant that a large number of hogs are marketed during the peak period, but since market sales and commercial storage capacity is limited, not all the hogs that peasants want to sell can be accepted. As a result, to some extent peasants, experience "difficulty selling hogs." During the slack season, few hogs are marketed so market consumption requirements cannot be met. Commercial departments then have to mobilize the masses to sell hogs. Some comrades feel that it is difficult to understand why hogs are said to be numerous for a time and scarce for a time. Actually this is a reflection of the conflict between supply and demand that exists objectively in commercial work. In a situation in which live hogs are substantially produced in countless dispersed households, it will not be easy to entirely circumvent this conflict within a short period of time.

Up until the time of the Third Plenary Session of the 11th Party Central Committee, growth in live hog production was unable to satisfy growth in consumption demand. After the Third Plenary Session, steady increase occurred in the number of live hogs in inventory. The fattening period was generally shortened; the inventory removal rate increased markedly, and the amount of pork available greatly increased. When this happened, for a time seasonal and local peasant "difficulty in selling hogs" became fairly pronounced. As a result of the concern of the CPC Central Committee and the State Council, during the past several years commercial departments have intensified procurement, expanded marketing, built more cold storage facilities, and expanded storage in a series of measures taken to moderate year by year the contradiction of "difficulty in selling hogs." Nevertheless, in a small number of key hog producing counties, during the peak season of hog production, the cry of "difficulty in selling hogs" can still be heard.

Sole reliance on state-owned business procurement and storage to wrap up the problem is not a good way in which to solve the problem of peasant difficulty in selling hogs. The joint efforts of all departments concerned are necessary to improve planning in the marketing of live hogs.

First it is necessary to improve planning in removal of fattened hogs from inventory in order to avoid overconcentration during the peak season, and particularly during the hot months of June and July, of removal of fattened hogs from inventory. Nowadays some households that specialize in the breeding of hogs have begun to realize this. They plan the time for breeding of sows, the birth of shoats, and removal from inventory of fattened hogs, avoiding, insofar as possible, sales of fattened hogs during the stiffling hot months of June and July. In essence, this amounts to the application to the hog raising industry of "operations research," and "optimization," which should be vigorously encouraged. State-owned agricultural and livestock farms, collectively owned hog-raising farms, households specializing in the raising of hogs, and key households can all do the same thing.

Second is detailed and solid work in live hog assigned procurement and planned procurement, in an effort to make purchases in a planned way to even out the market. This year commercial department signing of seasonal and monthly live hog purchase agreements with production teams or peasant households on the basis of assigned quotas and planned procurement quotas has played a definite role in the strengthening of planning. However, in some places, because there have been no fixed times established for sales in assigned procurement contracts, the peasants raise "quota hogs" during the first half of the year and "New Year's hogs" during the second half of the year. As a result, in these places during June and July markets "cannot get any," and during the last half of the year they "cannot take any." In some places production teams have not assigned state purchase quotas to individual households, so peasant sales of live hogs continue to lack planning. All this has to be conscientiously improved. In some places, once there is a surfeit of hogs commercial departments do not adhere to the effective and workable method of "going from door to door to inspect the hogs and setting up appointed times when they will purchase them" so as to avoid having the masses market their hogs blindly out of fear that they will be unable to sell them. Grassroots commercial staff and workers must persevere in going into the countryside to make purchases and to do a good job of publicity to set people's minds at ease. In places where a lot of buying and selling of hogs is done, commercial departments should also do a good job of organizational work for "earlier marketing" and "delayed sales" during the peak period, "evening out fluctuations," arranging marketing, and balancing purchases.

Third, looked at in long range terms, active development of lean hog types is necessary for gradual solution to the problem of insufficient lean pork and a surplus of fat pork. There are already considerable numbers of Landrace and large Yorkshire hogs everywhere, but because of

the single kind of feed available for them, and commune and brigade bonus and price policies, and remuneration for collecting hog manure all encourage the raising of large fat hogs. As a result even lean pork type hogs have been turned into fat type hogs. This requires study and improvement from the standpoints of improved hog varieties, improved feeds, and perfection of economic policies in order to give impetus to rapid development of lean pork type hogs.

9432

CSO: 4007/27

# CENTRALIZATION OF IRRIGATION IMPLEMENTED IN BAODING

Shijiazhuang HEBEI RIBAO in Chinese 24 Sep 82 p2

[Article: "Some Production Teams in Baoding Prefecture Set Up Irrigation Companies; Institute Independent Accounting, Centralized Management of Farmland Irrigation, and Solution to Problems of Commune Member Water Disputes"]

[Text] As part of the process of perfecting agricultural production responsibility systems, some production teams in Baoding Prefecture have set up irrigation companies (some are called pump well irrigation companies or specialized soil irrigation teams) with specific responsibility for irrigating the land. This has gained acceptance by the broad masses of commune members.

After 86.9 percent of production teams in Baoding Prefecture instituted responsibility systems whereby work responsibilities were assigned individual households, some new conflicts cropped up in irrigation. Matters such as calculation of compensation to pump well operators, collection of irrigation fees, and deciding the precedence of land to be irrigated all required equitable handling to meet the situation following institution of responsibility systems. In addition, after assignment of work responsibilities to individual households, some households purchased their own equipment for raising water. With the increase in such equipment, centralized use became impossible with the result that equipment lay idle and funds were wasted. Furthermore, the frequency with which equipment was moved around caused serious damage to water conservancy facilities. Individual households that had privately purchased machines were also free to use them as they liked, so instances occurred in which they hiked irrigation fees.

In order to solve these new conflicts, some production teams set up irrigation companies, transferring to the irrigation companies all collectively owned water conservancy facilities, pump wells, and water lifting equipment, the company being responsible for safeguarding them. Acting on the principle of voluntary participation for mutual benefit, privately owned water pumping equipment as well as the equipment operators were made a part of the company. Economically the company instituted independent accounting, responsibility for its own profits and losses, enterprise-style administration, and was responsible for management and



use of all of the brigade's drainage and irrigation facilities, becoming responsible for the irrigation of all farmland. The irrigation company strengthened administration and management, instituted personal responsibility systems for machinery operators, and assigned fields for which operators would be responsible for watering. In general, production team leaders came to an agreement with individual households about the time when their fields would be watered on the basis of field plot water requirements. The irrigation companies registered each well and collected fees on a time basis. Some collected fees on the basis of kilowatt hours used, and some collected fees on the basis of the number of mu watered. Jiaozhuang Production Brigade in Anguo County has 22 pump wells, 22 diesel engines, and 22 electric motors. After the production brigade established a pump well irrigation company, the company took responsibility for irrigation of the brigade's entire 1,783 mu, charging a fee of 0.07 yuan per hour of irrigation. This included a depreciation fee of 0.07 yuan to be used for equipment replacement, public accumulation and public welfare funds amounting to 0.13 yuan, and a management fee of 0.06 yuan, the three totaling 0.26 yuan, an equipment maintenance and repair fee of 0.07 yuan, and a fuel and electricity fee of 0.27 yuan for a total of 0.44 yuan under control of the pump operator, any savings belonging to him. The 11 diesel engines that the Luohe Production Brigade in Rongcheng County had privately bought, as well as 11 operators, became a part of the brigade's irrigation company. They worked 10 hours daily for slightly more than 4 yuan. This was beneficial to the collective and no loss for anyone.

After experience over a period of time, all the brigade operated irrigation companies in Baoding Prefecture demonstrated their superiority. The companies' centralized responsibility for irrigation changed a tumultuous situation that had existed in which no one had been responsible for irrigation and in which disputes over wells and pre-empting of water had occurred. This solved problems for commune members in getting irrigation water and a chaotic method of irrigation. As a result of the specialization of irrigation company activities, a saving in manpower, in equipment, in fuel and electricity were effected; irrigation costs were lowered; the irrigation cycle was shortened, and the pace of irrigation hastened for a reduction in peasant economic burdens and intensivity of labor. This helped collective production and development of individual household sideline occupations, and increased economic benefits.

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CSO: 4007/25

IDEAL TIMES FOR SOWING WINTER WHEAT IN HEBEI PROVINCE GIVEN

Shijiazhuang HEBEI RIBAO in Chinese 17 Sep 82 p 1

[Article: "The Right Time for Sowing Winter Wheat in Various Places"]

[Text] Sowing wheat at the right time is the key to development of sturdy seedlings and high yields, and whether sowing can be done on time or not is decided largely by accumulated temperatures before the onset of winter. If sowing is done too early or in years when the autumn is warm, if accumulated temperatures before the onset of winter amount to 700 degrees, the wheat seedlings may grow too vigorously. If, however, sowing is done too late or in years where the autumn is cold, accumulated temperatures before the onset of winter may be less than 100 degrees, and then weak seedlings may result.

An analysis of the long range weather forecast for the time when harvesting sowing and replanting will be done this fall shows a likelihood that total rainfall will be more than in most years, that the rain will be concentrated in the early period, that average monthly temperatures will be slightly lower than normal in September but close to normal in October, and that the first killing frost in most parts of the plain will come toward the end of the second 10 days period or early during the final 10 day period of October.

Analysis of the overall temperature trend shows that this fall will be a usual one, particularly that in wheat growing regions low soil moisture will be favorable. This year the most suitable time for sowing wheat will be about a day earlier than in most areas. In Shijiazhuang and Xingtai prefectures, the most suitable time will be between 24 September and 7 October. Wheat should be sown no earlier than 22 September at the earliest or no later than 14 October at the latest. In Tangshan and Langfang prefectures, the best time for sowing wheat will be between 29 September and 30 October. Sowing should not be done earlier than 17 September at earliest or later than 8 October at the latest. In Cangzhou and Hengshui prefectures, the most suitable time for the sowing of wheat will be between 23 September and 6 October. Planting should not be done any earlier than 21 September at the earliest or any later than 13 October at the latest. In Handan Prefecture, the most suitable time for sowing will be between 26 September and 9 October. Sowing should be no earlier than 23 September at the earliest and no later than 16 October at the latest. In Baoding Prefecture, the most suitable time for sowing will be between September and 3 October. Sowing should be done no earlier than 19 September at the earliest and no later than 10 October at the latest.

# BENEFITS OF FURROW SOWING OF WHEAT RECOGNIZED

Shijiazhuang HEBEI RIBAO in Chinese 24 Sep 82 p 1

[Article: "Remarkable Yield Increases From Furrow Sowing of Dryland Wheat in Experiments and Demonstrations Conducted by Hengshui Prefecture Agricultural Research Institute. Opens New Way To Increase Yields on Dryland, Infertile, and Saline-Alkaline Wheatfields. Province Makes It a Major Item for Demonstration and Promotion in Heilonggang Prefecture"]

[Text] Success has been achieved with new techniques for the sowing of wheat in furrows in arid areas that the Hengshui Prefecture Agricultural Institute has summarized, experimented with, demonstrated and promoted. Results of experiments at many sites over a period of 3 years have shown yields from the sowing of wheat in furrows to average 470 jin per mu, a 16.7 percent increase over flat sowing. In low yield wheatfields, the increase in yields was 26.6 percent, and in high yield wheatfields, it was 9.3 percent. During 1982 experiments were conducted at 29 places in the prefecture, increased yields occurring at 28 (at one place yields fell 1.3 percent). High, medium, and low yield wheatfields alike showed increased yields, the average yield increase being 23 percent. In low yield wheatfields, the increase amounted to 35 percent.

In order to develop a new situation in wheat production in Heilonggang Prefecture, to overcome aridity, soil infertility, salinity, freezing, hot dry winds and other natural disasters that occasion unfavorable conditions for wheat production in the prefecture, Hengshui Prefecture diligently summarized traditional experiences in the sowing of wheat in furrows during 1978, and began in 1979 to continue repeated experiments with this traditional experience. It further improved its summarization and study and verified that the sowing of wheat in furrows has overall effectiveness in combating drought and withstanding cold through retention of rain and snow, reduced evaporation, maintenance of soil moisture, avoidance of alkalinity, and improvement in the soil surface microclimate. It benefits wheat growth and development, and yields. Specifically:

1. sprouting rates are high, and a full stand of seedlings can be maintained. Furrow sowing parts the dry soil layer so that the seeds can effectively come in contact with the moist soil below to produce a high sprouting rate. At the Wukaihe Production Brigade in Hengshui County, on a plot of late wheat where soil moisture was seriously

depleted, water content was less than 10 percent from 0 to 10 centimeters down, and the dry soil layer was 7 centimeters thick. When furrow sowing was done just once, a full stand of seedlings resulted, but the seedling growth rate was only 30 percent from flat sowing, and sprouting was 7 days late. 2. It can promote the strengthening of seedlings before the onset of winter. Because the wheat seedlings within the furrows are well covered and little exposed, and since there is little airflow exchange near the ground, evaporation from the soil is reduced. In addition, precipitation concentrates in the furrows so that marked improvement in soil moisture takes place in the soil from a depth of zero to 10 centimeters. Measurements taken before the onset of winter showed moisture content in the furrows of 14.5 percent, 3.13 percent more than the moisture content of soil where seeds were flat sown. In addition, average air temperature in furrows was between 0.5 and 1 degree higher than in flat sown soil. Consequently, for furrow-sown wheat, root growth and tillering increases by about one-fourth. Leaf surface and weight of dry material increases by one-third, and main stem, and leaves of main stems increase by 0.8 leaves. 3. seedlings are protected for overwintering, and they develop early and grow rapidly in spring. Since furrows are sheltered from the wind and exposed to the sun, direct blasts of cold wind on the seedlings are avoided. In addition, as sides of the furrows slip downward, tillering nodes become buried rather deep, accumulate rain and become filled with snow, which helps the wheat sprouts overwinter. The winter of 1980 and 1981 had weather that killed large numbers of winter wheat seedlings. The seedlings death rate for flat sown wheat was 24.6 and 27.2 percent respectively, while the seedling death rate for furrow sown wheat was 17.2 and 12.6 percent respectively. Experimental data also show that furrow sown wheat greens up, starts to grow, and joints earlier than flat sown wheat. Fourth, furrow sowing promotes root system development, numbers, and size. Furrow sown wheat has from 597,000 to 1,996,000 more individual roots than flat sown wheat. Because the root system develops well, the wheat's resistance is increased, thereby bringing about an increase in spikes and an increase in grain, prevention of premature degeneration in the late stage, resistance to hot dry winds, and increase in grain weight.

Because furrow sown wheat techniques reduce, to a certain extent, damage from aridity, infertility, alkalinity, overwintering, and hot dry winds, it is able to increase wheat yields in dryland wheat growing areas. In April this year, the Chinese Academy of Agricultural Sciences, organized experts and scientific and technical personnel from the six provinces and municipalities of Hebei, Shandong, Hubei, Shaanxi, Beijing, and Tianjin to hold an on-site meeting for the exchange of experiences at Wukaihe Production Brigade in Hengshui County. Everyone gave full affirmation of the agronomical benefits of furrow sowing and prospects for its spread. They also decided on vigorous experimentation, demonstration, and promotion of furrow sowing in North China's wheat growing areas. The Provincial Wheat Work Conference decided to make it a major topic for demonstration and promotion in the province's Heilonggang Prefecture.

CREDIT GIVEN RESPONSIBILITY SYSTEMS FOR PREFECTURE'S ECONOMIC IMPROVEMENT

Shijiazhuang HEBEI RIBAO in Chinese 21 Sep 82 p 1

[Article by Rural Work Department, Baoding Prefecture CPC Committee:  
"Agricultural Production Responsibility Systems Have Brought New  
Vitality to Baoding Prefecture"]

[Text] Editor's Note: Eighty percent of production teams in Baoding Prefecture have instituted large scale assignment of responsibilities to individual households, and this year the area sown to wheat, though 560,000 mu less than last year, produced 150 million jin more wheat than last year. A comparison of the first half of this year with the same period last year shows output value of commune and brigade enterprises to be 15 percent greater, commune member income from household sideline occupations in the prefecture to be 12 percent greater, and agricultural use of diesel engines and tractors to have increased by 99 and 33 percent respectively.

Since the Third Plenary Session of the 11th Party Central Committee, Baoding Prefecture's production responsibility systems have grown rapidly. Eighty percent of production teams throughout the prefecture have instituted responsibility systems of large scale assignment of responsibilities to individual households, which have brought new vitality to agriculture. This year, despite a 560,000 mu reduction in the area sown to wheat, output increased 150 million jin. Comparison of the first half of this year with the same periods last year shows a 15 percent increase in output value of commune and brigade enterprises, a 12 percent increase in commune member income from household sideline occupations, and an increase in agricultural use of diesel engines, tractors, and water pumps of 99, 33 and 180 percent respectively.

In the process of implementing responsibility systems whereby work responsibilities are assigned individual households, the broad masses of cadres and commune members proceeded from realities, centralizing that which lent itself to centralization and decentralizing that which lent itself to decentralization. They generally instituted the centralization

of planting, sowing, and watering, and this not only brought into play the superiority of the collective economy but also reduced intensivity of peasant labor and very greatly changed production conditions. During spring and summer this year, the entire prefecture experienced a drought such as has rarely occurred. The water table fell by a general 3 to 6 meters, and cadres and commune members relied on the collective and on the pooled wisdom and efforts of everyone to sink more than 6,000 wells, to dig more than 50,000 indigenous style wells, and to buy more than 8,000 pieces of equipment for raising water. The prefecture expanded its irrigated area by more than 50,000 mu to assure the on-time watering of its large wheat area. This year both the prefecture's yields per unit of area and total output were higher than last year by 8 and 7 percent respectively. Moreover the increases in yields were even. Low yield counties having yields of less than 200 jin per mu fell from last year's seven to four. State purchase quotas were fulfilled with 184 million jin of grain for a 2.2 percent overfulfillment.

Institution of production responsibility systems promoted development of household sideline occupations and commune and brigade enterprises, increased peasant income, and enlivened rural markets. For the first half of this year, workforces engaged in commune and brigade industrial sideline occupations in the prefecture increased by more than 20,000 people over the same period last year, and income increased by more than 10 million yuan. Following assignment of agricultural work responsibility to individual households, a "craze for livestock breeding" occurred throughout the prefecture. Statistics from quarters concerned show that as of the end of June this year, the prefecture's hogs numbered 1.73 million for a 5.9 percent increase over the same period last year. Domestic fowl such as chickens, ducks, and geese numbered 15.27 million, a 76 percent increase over the same period last year. Specialized households and key households engaged in the breeding of livestock in the prefecture totaled 13,755. With the development of economic diversification, peasant income increased tremendously. Rural savings accounts for the first half of this year increased by 35 percent over the same period last year. Rural markets were brisk; there was a plentiful supply of goods, and business was good. For the first half of this year, country fair transactions totaled more than 100 million yuan, an 11.5 percent increase over the same period last year.

Production responsibility systems also gave impetus to development of agricultural science and technology. Rural village throughout the prefecture formed a network for promotion of agricultural techniques centering around agricultural science households. These networks gradually linked traditional production experiences to modern science for full play of the inherent potential that the land and the workforce contain to assure increased yields and increased income from crops.

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DEVELOPMENT OF PELLITIZING MACHINE FOR SUGARBEET DROSS REPORTED

Beijing RENMIN RIBAO in Chinese 24 Sep 82 p 1

[Article: "Nationally Produced Pellitizing Machine Successfully Manufactured; Sugarbeet Dross Becomes a Treasure. Sugar Refinery With Daily Output of 1,500 Tons Can Pellitize 80 Tons of Dross for Annual Earnings of 2.3 Million Yuan"]

[Text] The Haerbin Oxygen Machine Manufacturing Plant has developed a machine to pellitize sugarbeet dross, which will convert sugarbeet dross that had formerly been thrown away into a treasure.

The pellitizing machine is a piece of equipment that uses the waste (sugarbeet dross) resulting from the processing of sugarbeet raw materials by sugar refineries. Except for a small portion that had formerly been fed to livestock, the large quantity of waste that sugar refineries produced daily had been thrown away for the most part. After a time it rotted and stank, polluted the environment, and endangered human health. A survey has shown that in Heilongjiang Province alone annually such waste amounted to more than 2.7 million tons. If a pellitizing machine were used to compress it into dry pellet residue, it could be easily transported and stored, and it would make an extremely good feed for livestock. Sometimes, some of it might be exported as well. As an export price of 160 yuan per ton of pellitized residue, what with the daily pellitizing of 80 tons of residue by a sugarbeet refinery with a daily output of 1,500 tons of sugar, 2.30 million yuan could be earned annually and economic benefits would be quite impressive.

The Haerbin Oxygen Machine Manufacturing Plant actively served the sugar industry and in less than a year's time successfully developed the Type KL 2 pellitizing machine for the Heilongjiang Sugar Industry Company. Heilongjiang Province's Machinery Bureau and Sugar Industry Company organized 24 units to provide an evaluation. The evaluation team believes that the pellitizing machine developed by this plant is attractive and in good taste, that it operates reliably, that its operation and maintenance are convenient, and that its performance substantially meets design requirements.

China's sugar refineries imported a set of Japanese pelletizing equipment (two pellitizing machines, one cooling machine, and one sifting machine) at a cost of 480,000 yuan. The same set of equipment made by the Haerbin Oxygen Machine Manufacturing Plant has an ex-factory price of 156,000 yuan; furthermore spare parts can be provided promptly, the prices are cheap, and the plant can send

people to install and regulate the equipment. Consequently it is readily accepted by customers. As of now the plant has delivered 12 machines, which are in use with very good results in several major sugar refineries in Haerbin, Qiqihar, Jiamusi, and Acheng in Heilong Province.

9432

CSO: 4007/18



## MAJOR EFFORT TO INCREASE WHEAT OUTPUT REPORTED

Beijing RENMIN RIBAO in Chinese 10 Oct 82 p 2

[Article: "Henan Province Fall Wheat Sowing Area Large and Quality Good. Encouraged by Spirit of 12th Party Central Committee, People's Minds Are at East and Their Enthusiasm for Production High"]

[Text] The vast Henan heartland has now entered the extremely busy season of fall sowing. In the major wheat growing areas of Zhoukou, Xinxiang, Luoyang, and Kaifeng, as well as in the rural suburbs of Zhengzhou, the masses of peasants, encouraged by the spirit of the 12th Party Central Committee, have carefully chosen fine varieties of seeds, spread copious quantities of manure, and the area sown to wheat this fall is greater and quality better than in the past.

This year, everywhere in Henan Province a craze for hurried exchange of superior variety seeds has taken place. Each time seed stations have brought in a shipment of superior variety seeds, peasants have arrived in droves from all over as though going to a fair. Recently the Luoning County Superior Varieties Station brought in more than 500,000 jin of superior variety seeds. No sooner were they inside the station gate than they were snatched up in exchange for other grain until no more remained. "No planting of anything but superior varieties" has become the overwhelming desire of the broad masses of peasants in developing wheat production. Selection of the best from among superior varieties, and careful removal from superior varieties of any seeds that are not superior varieties, has become a conscious action by peasants in most areas to get high wheat yields.

At the same time, this year Henan peasant zeal for collecting manure, composting manure, and buying fertilizer has also been unprecedented. Arriving at a commune or brigade, one sees barnyard manure piled everywhere in front of and behind houses, inside and outside villages, along roads, and at the edges of fields. On some fields that have already been plowed and harrowed for the first time, barnyard manure has been spread with every step and now a dark black layer covers the fields. A peasant who had contracted land said, "When fertilizing used to be done, to tell the truth it was a case of moving soil from one place to another. Last year people still feared that policies might change, so the quality of crude manure was very poor, but this year the manure is the real thing." "The government has called for more fertilization to grow more grain. I put down more than 6 cubic meters per mu of crude manure, 100 jin of ammonium carbonate, and 120 jin of phosphate fertilizer as base fertilizer, so there is probably no doubt about harvesting a bumper

crop!" A survey done at Zhidian Commune in Chenqiu County showed each household had put down more than 4 cubic meters per mu of crude manure, and between 100 to 120 jin or more of ammonium carbonate and phosphate fertilizer. Actual amount of fertilizer used increased by about one-third over last year. In recent years benefits have been considerable from the use of phosphate fertilizer by numerous people, and phosphate fertilizer has become the means of production in shortest supply everywhere. This year, even though the quantities brought in by the state and purchased by people themselves have been vastly more than in previous years, the scramble to buy phosphate fertilizer can still be seen everywhere.

This year the area sown to wheat in Henan is larger than in any previous year. The peasants say, "Henan is a wheat growing area, so we have to do everything possible to sow more wheat." In Zhoukou Prefecture, for example, wheat has been sown on fields where spring sweet potatoes were to have been grown, and wheat and cotton have been intercropped on the spring cottonfield area. In addition, the 10 besides [beside houses, roads, streams, villages, etc] have been readied and ponds have been filled in for a very great increase in the actual area sown to wheat. This prefecture's planned wheat growing area has been increased to more than 8 million mu this year, an increase by about 500,000 mu over last year. The wheat growing area of other prefectures has also been expanded to varying degrees. In order to get high wheat yields, everywhere in Henan this year attention has been given intensive farming. Peasants have plowed and reseeded wheatfields, and harrowed and reseeded them. Some have required three cultivations and nine rakings. Some plots have been made level and the soil pulverized. In many places, in the process of cultivating and raking, pesticides have been applied against locally occurring insects. This year fertilization has been done differently than in past years as well. Not only has fertilization with nitrogenous, phosphate, and potash fertilizer been required for each plot, but balanced use of the three has also received attention. Formerly not enough attention was given base fertilizer, but this year great attention was devoted to the amount of base fertilizer put down. In Chenqiu County, for example, to make up soil fertility deficiencies and to meet needs for increased yields, this year it was proposed that a "1, 1, 3, 4" per mu average base fertilization be given (with individual variations for field plots in practice), by which was meant 100 jin of ammonium carbonate, 100 jin of phosphate fertilizer, 30 jin of urea, and 4 cubic meters of barnyard manure, both to assure full stands of sturdy seedlings, and to lay a foundation of normal growth of wheat seedlings next year.

9432

CSO: 4007/14

## FRESHWATER FISHING INDUSTRY RAPIDLY DEVELOPING

Beijing RENMIN RIBAO in Chinese 21 Sep 82 p 2

[Article: "High Speed, Highly Beneficial Development of Hubei's Freshwater Fishing Industry"]

[Text] Editor's Note: The issues this report raises on good handling of several relationships in development of a freshwater fishing industry can set people to thinking. Facts have shown that all that is needed is a clear guiding idea for good handling of these relationships and implementation of measures to increase output, and then the freshwater fishing industry can develop at high speed for high benefits.

Hubei has been often called the "province of 1,000 lakes." The climate here is temperate, rainfall copious; the land is traversed by streams; and the area is densely covered with lakes and reservoirs. Water surfaces usable for breeding amount to one-tenth the national amount of inland waterways usable for breeding. It is a major freshwater fishery area in China. Following the 3d Plenum of the 11th Party Central Committee, the province's fishing industry developed very quickly. Last year gross output of aquatic products amounted to more than 300 million jin for a revival of the all-time highest level. Average rate of growth during the past 3 years has been 11.1 percent. Counties in the province having an annual output of more than 5 million jin have increased from 14 before 1978 to last year's 23. The 10 years of turmoil caused damage to the fishing industry, but after 3 years of effort, the long standing fluctuation in output has been brought to an end.

Today, following diligent study and investigation, the provincial aquatic products sector has decided to handle several relationships well, thereby enabling high speed, highly beneficial development of the freshwater fishing industry. These relationships are as follows:

The relationship with state-owned fishing industry and the fishing industry owned by the masses. As a result of "leftist" influence and investment in construction, for a long time numerous comrades have given comparatively more attention to the state-owned fishing industry. Now, while taking firmly in hand development of the state-owned fishing industry, they have shifted the focus to the fishing industry owned by the masses including the breeding of fish by communes and brigades, commune members, and social organizations.

This is because of the following: First, more than 80 percent of the more than 300 million jin of fish produced in the province came from the rearing of fish by the masses. Second, from an investment standpoint, the state must underwrite the state-owned fishing industry in entirety, while the collective fishing industry requires an assistance kind of investment. When commune members and social organizations rear fish, the state is required to provide virtually no money. Third, only through an expansion of commune member rearing of fish can peasants, who comprise more than 80 percent of the population, have fish to eat, and only then can the state-owned fishing industry supply larger amounts of aquatic products to cities, towns, industries, and mines. Fourth, development of the mass fishing industry helps improve the natural environment, accommodates production and the daily life of the masses, and enlivens city and countryside markets. Fifth, development of the mass fishing industry helps stabilize the state-owned fishing industry's proprietary rights over water surfaces, maintains order in production of lake and reservoir areas, and truly achieves increased production, increased incomes, and increased contributions.

**Relationship Among Large, Medium Size and Small Water Surfaces.** For many years most large water surfaces have lay in a state of disuse or low production. The reason is that large water surfaces have three problems difficult of solution. One is that the administrative system cuts across lines and conflicts exist between fisheries and agriculture, and between the state (owned enterprises) and the masses (operations). Second, fish breeding ponds, the equipment required to pen fish in, and dike locks and stations all require a great investment for construction and equipment. Third production programs in fishery areas are in a shambles. Some comrades say that large water surface production consists of "a figuring of accounts that is gladdening, doing work that is wearing, and trying to raise output that is infuriating." Consequently, intensive raising for high yields on small water surfaces has to be the principal direction of attack, with intensive raising being paramount and use of small water surfaces for intensive raising being paramount. At the same time there can be no relaxation in management and utilization of large water surfaces.

**Relationship Between Extensive Rearing and Intensive Rearing.** In most places in Hubei Province, an extensive low yield situation has existed right up to the present of "release the fry and watch them grow; catch large and small till there are no more." Average yields for the province's more than 1 million mu of ponds has been only a little more than 100 jin per mu, lower than that of Guangdong and Hunan. About 40 counties in the province have pond surfaces of more than 300,000 mu. In Jingmen and Sui Counties, there are more than 100,000 mu, and potential is very great. In order to raise pond fish yields, it will be necessary, first of all, to change the present breeding of silver carp as the predominant fish so that herbivorous fish varieties with "heads that hang down" will be changed to fish with "big heads." Second is changes in the composition of fish food. Grass has to be grown to rear fish, turning grass into meat. Third is a good job of fish disease prevention and control work; and fourth is companion rearing of fish at separate levels in the water, and rotating catches with releases of fry.

Relationship Between Fish Rearing and Economic Diversification. It is necessary to proceed from water surface realities, setting up fisheries in places suited for fisheries, growing lotus in places suited to the growing of lotus, rearing fish in places suited for rearing, and using varieties suited to particular areas, striving to make the water surface breeding industry and the water surface growing industry thrive at the same time. Some communes and brigades have planted mulberry trees on pond banks and on fields growing feed to combine fisheries with the growing of mulberry. The pond mud fertilizes the mulberry; the mulberry leaves feed silkworms; and the silkworm excrement feeds fish for fairly good economic results. If all the province's several hundred thousand mu of continuous tract fish ponds did this, they would become a very large fishing industry base, silkworm mulberry base, and feed base. In this way, income amounts to several hundred yuan per mu of water surface, or even as much as 1,000 yuan. In addition, water surfaces may be used for development of pearl production.

Relationship Between State Plans and Market Regulation. The Hubei aquatic products sector believes that in studying aquatic products procurement and marketing policies, the basis should be to take the planned economy as the key link with market regulation being supplementary, and that state procurement quotas should be established for state-owned fishery farms, specialized communes and brigades, and commodity fish bases. Following fulfillment of state purchase quotas, production units should be allowed to dispose of surplus fish products in accordance with market management regulations. For communes and brigades, commune members, and social organizations, however, there should be no purchase quotas for the rearing of fish.

Right now Hubei's freshwater fishing industry is in good shape. As of the end of July, fresh fish output for the province was 11.8 percent greater than for the same period last year and purchases increased 27.3 percent. Amounts turned over to the state increased 15.6 percent and exports increased 10.5 percent. The rearing area increased 11.7 percent, and fingerlings released increased 13.9 percent. Especially heartening is that raising of fish by rural commune member households grew from 400,000 households last year to 520,000 households this year, and the breeding area expanded from somewhat more than 140,000 mu to 210,000 mu. In the commodity fish bases located along the Chang Jiang and both banks of the Hanshui, fish growth is heartening. In Honghu and Mianyang Counties, about one-third of the fishbase ponds have yields of 400 jin per mu. Both the state-owned fishing and suburban rearing of fish has developed substantially. Provincial Aquatic Products Bureau deputy director, Ma Jamin [7456 4949 3046] told reporters: "Attainment of the combat goal of an output of 1 billion jin of fresh fish for Hubei by the end of the century is an extremely formidable task; however, so long as guiding ideas are clear and all of the foregoing relationships handled well, policies and programs correct, and measures for increasing output solidly based, Hubei's freshwater fishing industry will certainly be able to develop at high speed and highly beneficially."

## INCREASE IN PEASANT SPENDING REPORTED

Beijing RENMIN RIBAO in Chinese 14 Oct 82 p 2

[Article: "Marked Increase in Peasant Purchasing Power in Liaocheng Prefecture. Jump in Sales of Means of Production and Means of Livelihood; Name Brand Goods Even Better Received"]

[Text] Rural markets in Liaocheng Prefecture in Shandong Province are unprecedently busy today. Peasant purchases of means of livelihood and means of production have spurted, and name brand goods are even better received.

Liaocheng Prefecture has been a notorious poverty stricken area in the country where peasant purchasing power has been very low. In recent years, peasant income has risen remarkably. In 1981 gross income from agriculture in the prefecture was more than 1.0 billion yuan and per capita distributions averaged 176 yuan. Commune member savings amounted to more than 160 million yuan, 10.1 times more than in 1978.

Most of the well-heeled peasants put purchases of the means of production in first place. According to statistics from the prefecture's supply and marketing system, total sales of the means of production were 40.7 percent greater in 1981 than in 1978, an increase of 40.7 percent. This included chemical fertilizer, pesticide devices, and medium and small farm implements, increase in the sale of which was fairly great. Peasant households buying farm machines and large livestock animals were also fairly common. The selection of peasant purchases of the means of production was also improved. With the launching of scientific farming and more careful attention to economic benefits, high nitrogen urea and phosphate fertilizer were in short supply, and highly effective pesticides of low residual toxicity were far from meeting peasant demand. Twelve horsepower tractors, which formerly sold poorly, became "hot items" liked by the peasants.

Last year sales of the means of livelihood in Liaocheng Prefecture reached more than 640 million yuan or 70 percent of total retail sales of social commodities. Among purchases, high quality durable consumer goods and name brand goods particularly characterized current purchases of the means of livelihood in Liaocheng Prefecture. Beer, bottled wine, canned goods, and such medium and high quality goods, which had formerly found markets only in cities, now sell well in rural villages as well.

## YUNCHENG PREFECTURE MAKING PROGRESS TO INSURE BUMPER WHEAT HARVEST

Beijing ZHONGGUO NONGMIN BAO in Chinese 23 Sep 82 p 1

[Article: "Progress Rapid and Quality High in Yuncheng Prefecture Preparations for Fall Sowing, Powered by Spirit of 12th Party Central Committee"]

[Text] Yuncheng Prefecture is one of the principal wheat growing regions of Shanxi Province. This year witnessed "three overs" in the growing of 5.4 million mu of wheat as follows: 15.4 percent over last year, 18.9 percent over plan, 10.4 percent over the all-time high. The broad masses' faces are wreathed in smiles. Upon hearing again during the 12th party Central Committee a reiteration that responsibility systems would endure without change for a long time, both cadres and commune members are more at ease. Each county further perfected various forms of production responsibility systems making them fit local circumstances more closely. Production teams practicing responsibility systems of "double contracting" [contracting to households both responsibility for fixed output quotas and completion of assigned work tasks] increased from 88.4 percent before the wheat harvest to 95.4 percent.

Inasmuch as the broad masses of people have sufficient zeal and great determination for the winning of a bumper wheat harvest next year, the entire prefecture has laid a fine foundation for a bumper wheat harvest next year. One is that much fertilizer has been made ready. Barnyard manure averages 3.98 cartloads per mu, 0.3 cartloads more than last year. Nitrogenous fertilizer averages 30.1 jin per mu, 9.4 jin more than last year. Phosphate fertilizer averages 24.4 jin per mu, 11.3 jin more than last year. Second is an increase in the deep-plowed area. About 3 million of the 3.68 million mu of the first crop wheatfields have been deeply plowed. This is more than 900,000 mu more than last year. Third is a greater area put in proper farming condition. The wheat-field area that has been carefully leveled amounts to 1.1 million mu, more than double last year's amount. Fourth is light cultivation and harrowing a larger number of times. Fifth is sufficient quantities of wheat seeds have been prepared and the quantity of select seeds is larger than last year. Throughout the prefecture, 56,280 "science and technology households," "associated households," and "key households," have undergone training to improve their skills so that wheat growing techniques will be spread from one neighbor to another to myriad households. In addition, departments concerned in prefectures and counties have printed large amounts of data about wheat growing techniques, and training classes have been run at every level. Training at the county, commune, and brigade levels in the prefecture has been given more than 520,000 attendees, more than in any other year.

## DEVELOPMENT OF DRYLAND CROP AGRICULTURE DISCUSSED

Taiyuan SHANXI NONGYE KEXUE [SHANXI AGRICULTURAL SCIENCES] in Chinese No 8, 1982 p 2

[Article by Liu Jie [0491 2638] and Guo Jinyu [6758 6855 3768] of the Agricultural Resources and Zoning Institute of the Shanxi Provincial Academy of Agricultural Sciences: "Exploring the Ways to Develop the Agriculture of Dryland Crops"]

[Text] Since ancient times, agriculture in Shanxi has mainly been an agriculture of dryland crops. Since liberation, although the wetland areas have developed greatly, the proportion of dryland-crop agriculture is still absolutely dominant. Bumper harvests or deficient harvests are determined to a large degree by rainfall. When the weather is favorable, agriculture will produce bumper harvests. When severe drought occurs, the output drops. Therefore, how to manage the dryland-crop agriculture has become a strategic problem in increasing agricultural output in Shanxi.

#### I. The Characteristics of Dryland-Crop Agriculture in Shanxi

There are four types of arid soil conditions in the world: Seasonal aridity of the tropics, tropical semi-aridity, subtropical semi-aridity, mid-latitude aridity and semi-aridity. The arid regions in Shanxi Province belong to the fourth type characterized by the following: Cold and warm seasons are clearly separated. Rainfall in the semi-arid regions is consistent with the rainfall in the warm seasons, but variation between years and between seasons is great. The standard annual rainfall lies between a lower limit of above 250 millimeters and an upper limit of 450 to 600 millimeters. The actually effective rainfall in Shanxi (natural rainfall minus runoff) is generally between 450 and 550 millimeters in the southeastern part and in some mountainous regions in the province and between 400 and 480 millimeters in other central and southern regions in the Province. It is between 350 and 400 millimeters in the northern regions. Generally, the annual supply rate of water (effective rainfall/total consumption of water) can at various times reach 55 percent and 90 percent. The water supply rate in river basins and low hilly regions is the poorest, while it is higher in the high mountain regions and the southeastern regions. Shanxi is a rather typical arid and semi-arid region.



Drought in Shanxi occurs most frequently in the spring. This has been the characteristic of drought in Shanxi for a long period. The so-called "9 years of drought out of every 10 years" mostly refers to the occurrence of spring drought. Since 1972, spring drought has caused damage to varying degrees almost every year. But this type of spring drought does not greatly affect the yield of autumn crops as long as moisture is conserved in winter and spring, seeds can be sown and the seedlings are managed well.

Summer drought generally causes lighter damage. From the last 10 days of May to the middle 10 days of June, a period when the growth of seedlings of autumn-sown crops is restrained, damage by drought is generally not large. Where summer drought occurs, there is the saying that "money cannot buy May drought, but when overcast weather continues in June, there will be a lot to eat". This notwithstanding, however, if summer drought persists for a long time, it will also cause serious damage, therefore there is the saying that "summer drought reduces output by half." In Yuncheng and Linfen Basin in the south, summer drought occurs more frequently, while in Taiyuan, Xinding Basin and in some hilly regions of constant aridity, drought occurs less frequently.

Summer drought mostly occurs in the central and southern parts of Shanxi, and the frequency is higher especially in the southern regions. From 1972 to 1979, the southern regions all suffered from severe summer drought, affecting the heading of summer sown crops and the forming of cotton bolls. The local people call this the "choking drought." The frequency of autumn drought is smaller. In recent years, it has mainly affected the sowing of wheat and the development of wheat seedlings in the south and but it has not affected other crops much.

## II. The Cause of Low Yields of Dryland Crops

At present, the agricultural yield of dryland crops is not high. There are mainly three reasons:

1. The land is infertile and there are fewer fertilizers. As a result, there is limited utilization of rain water. The low agricultural yield in drylands in ordinary years seems to be due to a lack of water, but actually it is due to a lack of fertilizers. The fundamental environmental factors for agricultural production are the five indispensable elements of light, heat, water, fertilizer and air. None of the five can be missing and one cannot replace the other. Whether the yield is high or low is determined by the lowest determining elements. The three elements of light, heat and air above, under present conditions of agricultural production, can satisfy the needs for producing a thousand jin or several thousand jin. But only the two elements of water and fertilizers are the determining factors in agricultural production. According to experiments and the output of advanced commune brigades, the amount of rain in an ordinary year is 400 to 500 millimeters, sufficient to produce 400 to 500 jin of output over large areas. But in reality, why have we been unable to reach this level? It is mainly because of insufficient

fertilizers and the deficiency of nutrients in the soil. According to the results of general surveys of the soil, only 25 percent of the total area of cultivated land throughout the province consist of soil with an organic content of over 1 percent, 40 percent of the land consists of soil with an organic content of over 0.5 percent, and the remaining 1/3 of the area consists of soil with an organic content below 0.5 percent. According to the results of general soil surveys conducted in the southeastern part of Shanxi, the nitrogen content of each mu of first grade soil is 10.1 jin, the phosphorus content is 5.1 jin. The nitrogen content in second grade soil is 8.7 jin, the phosphorus content is 2.7 jin. The nitrogen content in third grade soil is 7.7 jin and the phosphorus content is 2.5 jin. The deficiency of nitrogenous and phosphorous fertilizers is the determining factor here. Especially in dryland crop agriculture, phosphorous fertilizer is even more so, the main determining factor. Therefore, the fundamental solution in dryland crop agriculture is first to cultivate the fertility of the land, increase the content of organic substances and nitrogen and phosphorus in the soil and correspondingly use fertilizer to modify water and use water and fertilizer complementarily in cultivation.

2. Planting management is careless and the only available amount of rainfall is wasted. The high output experience of the masses over many years is "three tilling, six raking, nine hoeing and drilling." There is also the saying "one plow for wheat harvests and one hoe for autumn harvests." The reason that the output of many communes and brigades is low is closely related to a lack of "three tilling, six raking, and nine hoeing and drilling experience." At some places, the fields are only worked twice a year or three times a year, i.e.: Ploughing and sowing in spring and harvesting in autumn. Some places do better; adding a mid-tilling in between the spring sowing and autumn harvesting. A large amount of water is lost because the fields could not be tilled deeply to store water and water evaporates because the fields could not be raked. Weeds grow uniformly because mid-tilling could not be done in time, causing most of the several hundred millimeters of rain that have already fallen on the cultivated land to evaporate from the empty fields and from between plants.

3. Serious soil erosion carried away large amounts of water and soil fertility. Over 80 percent of the regions of dryland crops in Shanxi are mountainous. In most places, soil erosion is serious. This is the direct cause of soil infertility and aridity. Soil erosion caused serious erosion of the ground surface, soil fertility dropped, and the ability of the soil to store and retain water and moisture dropped. According to measurements made by the Shanxi Provincial Water Conservancy Institute, each ton of soil of the 0 to 15-centimeter soil layer on slopelands in western Shanxi contains 0.346 kilogram of whole nitrogen, 0.668 kilogram of whole phosphorus and 16.6 kilograms of whole potassium. The amount of fertilizers in the soil lost in soil erosion in western Shanxi, if calculated in terms of chemical fertilizers, was equivalent to 480,000 tons of ammonium sulphide, 2152,000 tons of calcium superphosphate, 12,095,000 tons of potassium sulphate. This is an important reason why the soil in the loess hilly regions is infertile, its ability to store water is poor and the yield is low.

### III. Important Ways to Increase Agricultural Yield of Dryland Crops

Generally speaking, our nation's agriculture of dryland crops has three major characteristics: One is organic agriculture, the second is highly refined tilling and planting, the third is man-made agriculture consisting mainly of terrace fields and farmland encircled by ditches. These three aspects have contributed greatly to world agriculture. Future development of the agriculture of dryland crops can be further improved based on these three foundations and by combining the advanced techniques of other nations of the world to open up a way for agricultural development suitable to our nation's actual situation.

1. We must open a way that combines organic agriculture and inorganic agriculture. "One water buffalo equals half an acre of farmland" has been our typical road in organic agriculture for thousands of years. The draft ox has been the main driving force in agriculture. Human and animal excrement and straws have been the source of fertilizers. The cycle of bioenergy will never be exhausted. The more it is used, the more it expands. To develop animal husbandry and improve soil fertility, southern Shanxi which is the main cotton and wheat producing region, has implemented the rotation planting system combining alfalfa, peas and cotton and wheat. This has enabled superior species of the large water buffalo to develop in southern Shanxi and also guaranteed the continued increase in soil fertility. In western Shanxi and northwestern Shanxi where there are fewer people and more land, the rotation planting system of pease, flat beans and food grains and oil bearing crops has been implemented according to plans. Central Shanxi and southeastern Shanxi have widely used the system of interplanting and rotation planting of graminaceous crops and leguminaceous crops. This has served a good function in improving soil fertility and increasing the nutrients and organic substances in the soil.

The practice of combining agriculture and animal husbandry, the reverse cropping system of rotation planting and interplanting of leguminous grazing grasses and graminaceous crops, soaking of straw and returning it to the fields have constituted our traditional organic agriculture. As our nation's industry develops, petroleum-based agriculture, consisting mainly of the tractor and chemical fertilizers, has played a huge role in the agricultural system. The yield per unit area in the production of food grains in Shanxi Province has improved as the use of chemical fertilizers increased, and this has correspondingly increased the amount of straw and roots by the same percentage. After the straw was returned to the fields directly or indirectly, it again stimulated the increase of organic substances in the soil and increased the various effective nutrients in the soil. Therefore, we should follow the path of "using the organic to guarantee the inorganic, using the inorganic to stimulate the organic" in improving fertility. This means, we must follow the path of combining organic agriculture and inorganic agriculture. Some problems still exist in the application of chemical fertilizers at present. For example, some high yielding communes and brigades apply too much chemical fertilizer and this greatly increases production costs. Certain commune brigades neglect the accumulation and application of farm manure. The proportion of nitrogen and phosphorus is imbalanced. There are also problems with improper storage, management and utilization. Applying less chemical fertilizer or none at all will not solve these problems. We must find a proportional relationship between carbon and nitrogen, for the application of nitrogen, phosphorus

and potassium, and between organic nitrogen and inorganic nitrogen. Only when proportionally balanced fertilizers and apples, can we avoid destroying soil fertility due to excessive application of nitrogen fertilizers. At present, an important problem in organic fertilizers is to quickly solve the problem of fuel in farm villages. Shanxi has the richest coal resources. Over 70 percent of the region produces coal. Therefore, exchanging coal for straw and returning straw to the fields directly and indirectly to improve soil fertility, and increase the output of food grains and other agricultural crops are more economical than using coal directly to exchange for agricultural products. In addition, appropriate development of alfalfa in southern Shanxi and popularizing alfalfa, sweet clover, false indigo and sedge and such green manure crops by communes and brigades in a big way in western Shanxi and north-western Shanxi, where there is more land, and fewer people and where soil erosion is serious, can help to reduce the loss of water, develop animal husbandry, improve soil fertility and solve the problem of fuel.

2. We should follow the road of combining fine traditional tilling and cropping technique and modern tilling and cropping technique. Traditional cropping in dryland crop agriculture is characterized by the maximum utilization of natural rainfall. The method of "three tilling, six raking, nine hoeing and drilling" is the typical experience of fine tilling and cropping in dryland. We should organically combine the traditional cropping and modern cropping techniques to create new ways to increase output of our nation's dryland crop agriculture. The key is to uniformly regulate the whole year's rainfall. Annual rainfall in the dryland crop regions in Shanxi is generally between 400 and 600 millimeters, and 70 percent of the rainfall is concentrated in the three months of July, August and September. In spring when water is needed, there is a lack of water. In summer, there is frequently too much rain water. This forms the special situation of spring drought and summer waterlogging. To uniformly adjust the whole year's rainfall, the only effective method is to store all the rain water. The methods of storing rain water are as follows: One way is to build reservoirs to store surplus rain water during the year and then use it when needed. Although this method is good, we cannot fundamentally solve the problem because of the limitations of topography and funds. The other method is to utilize traditional cropping techniques to establish a "cropping layer reservoir." The so-called cropping layer reservoir involves deep ploughing and shallow ploughing in summer and autumn, preserving and preserving moisture in spring and autumn loosen the soil structure of the cropping layer and creating advantageous conditions for storing rain water. During winter and spring when there is less rain, the fields should be raked many times to reduce evaporation of water. During the period from the planting of wheat in autumn to sowing in spring, the fields should be heavily packed in order to bring out the moisture from the deep layers to the sowing layer so to ensure that the seeds will germinate and the root will grow. This is what is commonly called "using summer water in autumn" and "using autumn water in spring." The wheat fields of Dongguanzhuang Brigade in Wensi County were first deeply tilled in summer. After 7 August; the fields should be harrowed also as to absorb as much summer rain water as possible. The new cropping method of "four early three more" should be used. That is, clean stubbles early, deep ploughing early, fine plowing early, and harrow the soil early, more light plowing, more fine plowing, and more light harrowing of

the fields so that every drop of rain water is kept in the fields, the soil is loose inside and not cracked outside, the surface soil does not have cracks, evaporation is prevented, and the top part is loose and the bottom part is solid without clods. In 1975, that brigade contrasted the new and old tilling methods. The amount of water stored in the soil layer between 0 and 200 millimeters after using the new tilling method and before sowing wheat was 408.8 millimeters, more than that using the old tilling method by 61.6 millimeters. Jinzhuang Brigade in Huguan County used autumn tilling combined with the application of fertilizers and the tilling technique of harrowing the field more times in early spring. The water content in the tilled layer in spring was 3 percent more than the water content in the soil fertilized and tilled in spring. In most years, this could guarantee timely sowing and the preservation of full seedlings.

On the basis of traditional fine tilling and cropping, we must also actively introduce and test the advanced techniques of other nations, such as the use of weeders, the tilling less method, and the method of planting without tilling. These have produced good results after testing in certain regions. Very good results were realized by using ground coverings in planting cotton. Agricultural production using factory-produced large plastic tents will create new conditions for intensive agricultural production.

3. We should follow the road that combines engineering management and biological management. Of the total area of Shanxi, 80.3 percent consists of mountainous and hilly regions. Most of the nearly 60,000,000 mu of cultivated land is hilly mountain land. To guarantee the yield of slopeland in mountain regions, our ancestor created horizontal terrace fields on slopeland and built embankments in trenches and valleys to create land. Such techniques have been proven by history to be successful. The building of terrace fields and land encircled by embankments in trenches to create three-dimensional basic farmland is the fundamental way to develop dryland crop agriculture in mountain regions. It can also be considered a major invention by our ancestors in agricultural production.

To fundamentally solve soil erosion in mountain regions and change the ecological environment, it is not enough to rely on building embankments, preparing land, building terraced fields. We must carry out biological control based on engineering control, return slopeland over 15 degrees in inclination for forestation and grazing, and change the present vicious cycle into a beneficial cycle. Shanxi Province has found effective ways in water and soil conservation over the past 30 years. The main experience is the insistence on comprehensive dredging of small river basins and taking small river basins as the unit in water and soil conservation. The present area is small. We must not expand outside the commune area. Such work should be carried out by brigades from top to bottom so that biological and engineering measures can be combined. We should plant forests and grass on precipitous slopes and mountain tops, and build terrace fields at the foot of mountains and on gentle slopes below the forests and grassland. Work should be done by contract. The state can provide appropriate investment. We should insist on centralized and continuous management. Then, we will produce definite results. This is an effective method of water and soil conservation at present that requires little investment and that will produce quick benefits.

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TITLE: "Preliminary Results of General Soil Survey of Suburbs of Shanghai"

SOURCE: Shanghai SHANGHAI NONGYE KEJI [SHANGHAI AGRICULTURAL SCIENCE AND TECHNOLOGY] in Chinese No 5, 5 Oct 82 pp 1-3

ABSTRACT: Based upon The Document No 111 (1979) of the State Council, the second general soil survey of Shanghai began to be carried out in the autumn of 1979 with Chengdong Commune of Qingpu County as the test point. The Institute of Soil and Fertilizer of the Municipal Academy of Agricultural Sciences, the Soil and Fertilizer Station of the municipal Bureau of Agriculture, Shanghai Academy of Agriculture, municipal Bureau of Water Conservancy, etc. participated in the work, which lasted nearly 80 days. This paper is a brief report of the comprehensive results of the survey of the test point. Chengdong Commune used to be lake-bed low-lying lands. After silting, developing, and cultivating, the soil has matured from the marsh soil origin into low paddy soil of poor drainage. Due to the constant anaerobic reduction state, the residues of aquatic plants are only partially decomposed and utilized by microbes to cause gigantic accumulation of humus. The organic matter content is at 4-5 percent and whole nitrogen above 0.2 percent. Below the topsoil, there is a layer of muck soil or peat. Further below, there is a layer of gley, affected by

[continuation of SHANGHAI NONGYE KEJI No 5, 1982 pp 1-3]

prolonged soaking in the ground water. Although it has long been believed that the soil parent material is entirely limnetic facies, this survey revealed some cross sedimentation of fluvial, limnetic, and marine parent materials. The survey revealed that 3.2 percent of the area of the commune have a ground water table less than 50 cm, 0.8 percent at 50-80 cm, 31.8 percent at 80-100 cm, and 14 percent at 100-120 cm. Since the liberation, efforts have been given to constructing water conservancy structures and the commune is basically protected from flood damages, but there remain various degrees of water-logging damages. At present, about 34 percent of the soils of the commune are severely water-logged and draining is urgently needed to lower the ground water table of these soils. These and other findings of the survey are reported.

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TITLE: "Paddy Soil Clay Minerals in the Region of Shanghai"

SOURCE: Shanghai SHANGHAI NONGYE KEJI [SHANGHAI AGRICULTURAL SCIENCE AND TECHNOLOGY] in Chinese No 5, 5 Oct 82 pp 4-6

ABSTRACT: For the purpose of understanding the mineral composition, distribution, and physical-chemical properties of the clay granules of soil in order to study soil formation, and identify the soil type and fertility, x-ray diffraction, electromicroscopic photography, and chemical analysis techniques were adopted to observe samples taken from 6 typical profiles of suburbs of Shanghai. Results indicate that in the paddy soil clay minerals, the  $\text{SiO}_2$  content is high, at about 44.46-48.32 percent. The  $\text{Al}_2\text{O}_3$  content is between 22.13 and 24.02 percent. On the profile and in the lower layer, the range of variation is insignificant. The  $\text{Fe}_2\text{O}_3$  content varies at 8.9-10.74 percent. The positive ion exchange is between 33.30 and 42.20 me/100g. The silicon-aluminum rate is 3.2-3.5; the silicon-iron-aluminum rate is 2.51 - 2.84; the whole potassium ( $\text{K}_2\text{O}$ ) is 2.82-3.17 percent. The relationship between the clay mineral composition and soil nutrients is discussed. The x-ray diffraction spectrograms of the soil clay minerals of the samples taken from the 6 profiles are reproduced in the paper.

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TITLE: "Preliminary Report of Experimental Cultivation of Early-ripening Wheat 7630"

SOURCE: Shanghai SHANGHAI NONGYE KEJI [SHANGHAI AGRICULTURAL SCIENCE AND TECHNOLOGY] in Chinese No 5, 5 Oct 82 pp 16-17

ABSTRACT: The 7630 is an early-ripening wheat, bred out by Zhenjiang Prefecture Institute of Agricultural Sciences, Jiangsu Province. It was introduced to Shanghai County Institute of Agricultural Sciences for trial cultivation in 1979 and a yield of 724.8 jin/mu was obtained. It was rated No 4 of the 10 breeds participating in the experiment. In 1980, from 1.77 mu of intercropped spring soybean and small-row seeded wheat (35 percent wheat) 546 jin of wheat was harvested. The results of all test points show yield increases of 3-18 percent above Yangmai No 3. The growth and development characteristics, the utilization values, and the essential points of cultivation technique of the 7630 are discussed.

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TITLE: "Classification and Utilization of Climatic Resource of Shanghai Favorable for Triple-crop Grain System"

SOURCE: Shanghai SHANGHAI NONGYE KEJI [SHANGHAI AGRICULTURAL SCIENCE AND TECHNOLOGY] in Chinese No 5, 5 Oct 82 pp 27-29

ABSTRACT: When 3 crops of grains are cultivated in a year in the suburbs of Shanghai, the yield is often not stable due to the variation of the weather condition from year to year. The major problem is the low temperature damage to late rice in the autumn. This paper studies the heat energy resources of the region of Shanghai and divides the region in accordance with the distribution of  $>10^{\circ}\text{C}$  cumulative temperature during the growth and development period of the late rice crop. On the basis of the classification, the paper concludes that the heat energy condition of Chongming Island is too poor for a triple-crop system. The southern parts of the 2 counties of Jinshan and Fengxian may become the chief area of a triple-crop system. The heat condition of the area of Jiading, Qingpu, and Songjiang can only allow a mixed system of dual and triple crops while Chuansha, Nanwei, and the eastern part of Shanghai County may cultivate 3 crops a year with a grain and cotton rotation system to adjust the seasons.

AUTHOR: ZHU Yaoting [2612 5069 1656]

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TITLE: "A Study on Improving the Lean Meat Rate of Pigs"

SOURCE: Shanghai SHANGHAI NONGYE KEJI [SHANGHAI AGRICULTURAL SCIENCE AND TECHNOLOGY] in Chinese No 5, 5 Oct 82 pp 31, 30

ABSTRACT: With the development of the national economy and the improvement of the standard of living of the people, the consumers have begun to prefer lean meat and stock of unsold fat pork has begun to accumulate. In Hong Kong, lean pork is selling at about 13.22 HK yuan/jin while fat pork is only about 0.66 HK yuan/jin. Even at the price difference of 20-fold, fat pork still does not sell. In 1980-81, an experiment was carried out jointly by Shanghai Food Export Company, Huacao Breeding Farm of Shanghai County, et al to produce lean porkers through hybridization of 183 pigs. Comparing 5 groupings, hybrids of Shanghai White Pig x Duleke Pig appear to be the best, producing 30.60 percent lean meat in the legs and 60.71 percent lean meat in the body (average of 39 hybrids.) The best mixture of feed and the best feeding method to produce a high lean meat rate are also studied and reported.



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TITLE: "Preliminary Report of Experiment With Cultivating Wheat in Rice Paddy Without Plowing"

SOURCE: Shanghai SHANGHAI NONGYE KEJI [SHANGHAI AGRICULTURAL SCIENCE AND TECHNOLOGY]  
in Chinese No 5, 5 Oct 82 pp 37-38

ABSTRACT: Jiading County has a high crop-repeating index and intense conflict of seasons, especially in years of frequent rains when plowing and planting of wheat must all be performed in soggy fields. If the weather is dry, the soil may easily become too tight for the growth of wheat seedlings. This is the main reason for low wheat yield in the county. In 1981-82, the authors experimented with cultivating wheat in rice paddies without plowing. More than 10 experimental points were established in several communes, totaling 15 mu. Three methods were tried: (1) Seeding wheat between rows of rice 10-15 days before the rice harvest; (2) Broadcasting wheat seeds after the rice harvest; (3) Seeding in rows of 2 cun with 5-7 cun in between the wheat rows. Plowed paddies are used for control. Results indicate that on the average (90 percent of the test points) without plowing, the yield of wheat is 4-14 percent higher. The yield is 2.7 percent lower than the control in one test point only. In 1982, the experiment was enlarged to 3,000 mu. The average yield of 50 mu in Zhuxiao Brigade No 9 averaged 775 jin/mu, 114 jin/mu higher than that of the control.

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TITLE: "Selection Breeding of the Early Ripening 7750 System of Rape"

SOURCE: Shanghai SHANGHAI NONGYE KEJI [SHANGHAI AGRICULTURAL SCIENCE AND TECHNOLOGY]  
in Chinese No 5, 5 Oct 82 p 38

ABSTRACT: Experimental hybridization of the kohl-rabi type rape and the white cabbage type Nanhui native rape began in 1975 to select and breed out a new system of early ripening rape 7750. After 2 summers of propagation, beginning in 1978, its yield began to be compared with Shengli and 7055 for 3 years. The yield of 7750 is thus determined to be 339.1 jin/mu, 34.7 percent higher than Shengli and 22.4 percent higher than 7055. The 7750 has become the farm breed in Nanhui County since 1979. In regular production, its yield has generally been about 300 jin/mu; may be as high as 350 jin/mu in some high yield fields. Its cultivation technique is introduced.

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CSO: 4011/24

Farm Machinery

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TITLE: "The Hanchuan 4-B-141 Model Cotton Uprooter"

SOURCE: Beijing NONGYE JIXIE [FARM MACHINERY] in Chinese No 9, Sep 82 pp 12-13

ABSTRACT: For the purpose of lightening labor intensity and improving productivity, the Hanchuan County Institute of Agricultural Machinery began in 1979 to try to make a cotton uprooting machine. Several prototypes have been made, and on the basis of these, the small Hanchuan 4B-141 was produced as the finalized model. It is to be used with a 3 hp walking tractor. Test operations have proved that it can pull up cotton stubble successfully and stack these stumps into a pile at a work efficiency of 2.5-3.1 mu/hr, 7-9 times higher than manual pulling. It was tried last year by Yongfeng Brigade and won the approval of the masses. The cost of uprooting the cotton stubble using this machine is 0.23 yuan/mu, 0.40 yuan less than using manual labor. The structural and work theory and the major technical parameters of this uprooter are given in the paper and illustrated with several drawings.

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TITLE: "The ST-70 Model Thresher"

SOURCE: Beijing NONGYE JIXIE [FARM MACHINERY] in Chinese No 9, Sep 82 pp 16

ABSTRACT: For the purpose of resolving the problems of existing middle-sized threshers, in cooperation with Muping County Agricultural Machinery Plant, Wuzhong County Agricultural Machinery Plant, Taiyuan City Threshing Machine Plant, Taigu County Agricultural Machinery Plant, and related provincial centers of agricultural machinery, the China Academy of Agricultural Machinery has made the ST-70 model thresher, with a compact structure, high productivity, and a long useful life. It may be easily moved about and adjusted. This machine basically resolves the problem of air backup of the material feeding opening; the operating condition of the thresher is thus much improved. This new machine has been certified at the ministry level. The new model comes in both the single and the double roller types. Structures of both are briefly described and illustrated with drawings.

6248

CSO: 4011/29

## Forestry

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TITLE: "The Exploitation of Tropical Rainforests in Relation to Soil and Water Conservation in Southern Yunnan"

SOURCE: Beijing LINYE KEXUE [SCIENTIA SILVAE SINICAE] in Chinese No 3, Aug 82  
pp 245-257

TEXT OF ENGLISH ABSTRACT: In order to study the laws of soil and water loss of the tropical rainforest and the exploitation and utilization of its land, we have carried out a field-plot experiment of water loss and soil erosion in southern Yunnan during the six years from 1962 to 1967. The results of the study are summarized as follows:

1. The seasonal variation of soil and water loss in southern Yunnan is very obvious. It may be divided into three different periods based on soil and water loss over the six-year period.
  - (1) The period of slight soil and water loss in the hot and dry season (February to May).
  - (2) The period of severe soil and water loss in the rainy season (June to August).

[Continuation of LINYE KEXUE No 3, Aug 82 pp 245-257]

- (3) The period of slight soil and water loss in the cold and cool season (September to January of the next year).
2. The general law is that the runoff, the soil erosion and the runoff coefficient increase with every increase of rain capacity and rainfall intensity in this region.
3. In different utilizations, the soil and water loss of the rubber-tea community is 22.3 percent and 29.7 percent lower than that of a pure rubber plantation, and 95.7 percent and 93.9 percent lower than that of farm crops. Therefore, transforming farmland into rubber-tea community or economic forest land of two stories is a better way of utilizing tropical mountainous areas rationally and decreasing the loss of soil and water.
4. The results of the study still show that the loss of soil and water on the farmland of shifting cultivation is the most serious. It is 778.3 times and 34.5 times that of the tropical rainforest, and 6.6 times and 5.7 times that of the bench terrace, respectively. In order to restore the function of the tropical rainforest ecosystem and prevent the loss of soil and water on farmland in this region, we must safeguard the tropical rainforest against deforestation. We must change the slope land to contoured terrace, and reform step by step the cropping system of shifting cultivation into that of rational rotation of crops. These are efficient measures for raising soil fertility, keeping water and soil, fixing farmland and obtaining high yield of crops.

Grain Cultivation

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TITLE: "Research on Large Area High and Stable Yield Cultivation Technique for Grains and Beans in the Central Parts of Liaoning Province"

SOURCE: Dalian LIAONING NONGYE KEXUE [LIAONING AGRICULTURAL SCIENCES] in Chinese No 5, 15 Oct 82 pp 7-10

ABSTRACT: Central Liaoning is one of the major bases of commercial grains in the Northeast. In the past decade, due to overemphasis of grain production, the corn acreage has been consistently enlarged at the expense of gaoliang and soybean and the improper coordination of organic and inorganic fertilizers has resulted in reduction of soil fertility and worsening of agro-ecology. According to tests taken in 1979, the soil organic matter content has dropped from the 1.39 percent of 1975 to 1.25 percent, a rate of reduction of 0.035 percent per year. Incidences of head smut have been 10-30 percent in the last several years. For these reasons, a research project was carried out by the institute in 3 production brigades of Haicheng County to experiment with the following items: (1) To change horizontal seeding to mound seeding to improve drought, flood, lodging, and wind resistance of corn; (2) To change breeds of corn and soybean for better yielding and other manifestations; (3) To increase manure, farm fertilizer, and phosphate applications; (4) Reasonable density to improve utilization of photo-energy and land; (5) Green manure cropping to nurture soil fertility. Yield increase results in the 3 brigades in 1980 and 81 are reported.

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TITLE: "On Improving the Fertilizer Application System for Rice---Replacing the 'Top Heavy' Application Method With Late Stage Follow-up Method"

SOURCE: Dalian LIAONING NONGYE KEXUE [LIAONING AGRICULTURAL SCIENCES] in Chinese No 5, 15 Oct 82 pp 14-18

ABSTRACT: The top heavy method of fertilizer application had been in use in the rice paddies of Liaoning until the early 70's. Under the condition of small amount of nitrogen application, this was a method of applying mainly tillering fertilizer to guarantee the yield increase effect. In recent years, the quantity of nitrogen fertilizer has reached a high level and with the top heavy method, serious lodging has occurred. In years of low temperature, the growth and development period became too long as well. Studies carried out by the Institute of Rice Crops and the Institute of Soil and Fertilizer demonstrated that the old method had to be changed. After 2-3 years of testing, a new method of applying nitrogen fertilizer as follow-ups in different stages was adopted to replace the old and yield increase results of 7-10 percent have been obtained. The new method is offered in the paper for the reference of rice growing regions of the Northeast, the Southern Plains, as well as the cold rice growing regions of the North.

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TITLE: "An Analysis of Trend of Annual Precipitation Distribution in Yunnan Province"

SOURCE: Beijing QIXIANG [METEOROLOGICAL MONTHLY] in Chinese No 8, 10 Aug 82  
pp 12-14

ABSTRACT: Many studies have been carried out on the relationship between the annual total rainfall  $R$  (one of the most important climatic parameters) and various geographical factors, but it remains difficult to provide a precise and objective simulation of the spatial structure of  $R$ . The difficulty is due to the fact that  $R$  is a very complex function, determined not only by the geographical location  $V(\lambda, \varphi)$  of the observation point but also by the extremely variable factors of the terrain. Of these, the elevation  $H$  is easily directly expressed by related parameters and its relationship is often reported by various areas in recent years. Others, such as the direction and the grade of the slope, its openness etc. do not yet have suitable indices. For a comprehensive reflection of their quantitative action on rainfall, the function  $C$  is abstractly used in the paper to represent the terrain. For the purpose of finding some geographical reasons for the annual rainfall distribution in the 330,000 km<sup>2</sup> of area of Yunnan Province, this paper proceeds with some rough mathematical analysis of the spatial structure of distribution of the annual rainfall in the province. The data of the 130+ weather stations in the province are used in the analysis.

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CSO: 4011/16

## Plant Protection

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TITLE: "Preliminary Studies on Physiological Forms of Cotton Verticillium Wilt Fungus"

[Continuation of ZHIWU BAOHU XUEBAO No 3, Sep 82 pp 145-148]

SOURCE: Tianjin ZHIWU BAOHU XUEBAO [ACTA PHYTOPHYLACTICA SINICA] in Chinese No 3, Sep 82 pp 145-148

TEXT OF ENGLISH ABSTRACT: Different hosts, including nine cultivars belonging to three species of *Gossypium* (*G. hirsutum*, *G. barbadens*, *G. arboreum*) were used for identifying the physiological form of *Verticillium dahliae* Kleb. Ten isolates of cotton Verticillium wilt fungus collected from eight provinces were identified and classified into three forms. Form I was highly pathogenic to three species of *Gossypium*, mainly including the "Jin Yang" strains of Shanxi Province. Form II was less pathogenic to all tested hosts. This form included mainly the "He Tian" and "Che Pai Zi" strains of the Xinjiang Uyghur Autonomous Region. The pathogenicity of Form III was between that of Form I and Form II. This form mainly included the strains of eight other counties of six provinces.

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TITLE: "Studies on Resistance of Sweet Potato Varieties to Bacterial Wilt"

SOURCE: Tianjin ZHIWU BAOHU XUEBAO [ACTA PHYTOPHYLACTICA SINICA] in Chinese No 3,  
Sep 82 pp 149-152

TEXT OF ENGLISH ABSTRACT: From 1977 to 1981 more than 500 sweet potato varieties from domestic sources and abroad were tested in some severely epidemical regions of bacterial wilt in Fujian for determining their resistance. The results showed that none of them was immune, but there was considerable variation among their disease incidence. Of these varieties, 17 were highly resistant (disease incidence 0.1 ~ 10 percent and its index 1 ~ 5), and 88 varieties were moderately resistant (disease incidence less than 11 ~ 39 percent and its index 6 ~ 20).

According to the recorded data in recent years from many epidemical regions, it was also proved that the depression of resistance of these varieties occurred after continuous planting for 2 ~ 3 years, and it was variable among different varieties. Therefore, in order to prevent the bacterial wilt of the sweet potato, it is necessary to adopt some measures, such as changing the variety annually,

[Continuation of ZHIWU BAOHU XUEBAO No 3, Sep 82 pp 149-152]

continuous selecting of highly resistant varieties, planting new resistant varieties, etc.

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TITLE: "Studies on Stunt Mosaic Disease of Spinach"

SOURCE: Tianjin ZHIWU BAOHU XUEBAO [ACTA PHYTOPHYLACTICA SINICA] in Chinese No 3,  
Sep 82 pp 153-156

TEXT OF ENGLISH ABSTRACT: A spinach stunt mosaic virus was isolated in the spring  
of 1981 in a spinach field on the outskirts of Beijing. The spinach infected  
with this virus appeared dark green with yellow mosaic. The leaves were crinkled  
and malformed, and the plants were severely stunted.

The host range has been tested by sap inoculation. The virus can infect 19 species  
of plants, including the families Leguminosae, Solanaceae, Chenopodiaceae, etc.  
It is transmissible by the aphid (*Myzus persicae*) in a non-persistent manner. The  
thermal inactivation point is 70°C, dilution end point is  $10^{-4}$ ~ $10^{-5}$  and longevity  
in vitro is three days.

[Continuation of ZHIWU BAOHU XUEBAO No 3, Sep 82 pp 153-156]

The virus was purified from *Chenopodium quinoa* or *Gomphrena globosa* by means of  
chloroform clarification, 10 percent PEG-6000 precipitation and two cycles of  
differential centrifugation. Electron microscopy revealed that the isometric  
virus particles were 24-25 nm in diameter. The examination of the sedimentation  
pattern of this virus has given three S values--57S, 94S and 113S. The antiserum  
titer prepared for this virus is 1:512.

From the data obtained here a tentative conclusion has been made--that the agent  
of spinach stunt mosaic disease is a strain of broad bean wilt virus.



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TITLE: "Isolation and Identification of Viruses Infecting Saccharine Melon in Xinjiang"

SOURCE: Tianjin ZHIWU BAOHU XUEBAO [ACTA PHYTOPHYLACTICA SINICA] in Chinese No 3, Sep 82 pp 157-162

TEXT OF ENGLISH ABSTRACT: We investigated and collected 19 samples of Saccharine Melon (*Cucumis melo* var. *saccharinus melo*) and other Cucubits during 1980-1981 in Shihezi, Tulufan and Changji, Xinjiang.

The samples were identified on the basis of host range, serology and electron microscopy. Two entities of virus were detected from these samples.

The host range of the first group is wide. Infected are *Cucurbitaceae*, *Leguminosae*, *Solanaceae*, *Chenopodiaceae*, *Compositae* and others. A clear precipitate line occurs with antisera against CMV in an immunodiffusion test. The

[Continuation of ZHIWU BAOHU XUEBAO No 3, Sep 82 pp 157-162]

spheroidal virus particles have been observed by electron microscopy. The group has been determined to be a strain of CMV.

The second group infects *Cucurbitaceae*, *Leguminosae* and *Chenopodiaceae*. A clear precipitate line occurs with antisera against WMV-2. The filamentous virus particles have been observed by electron microscopy. The group has been determined to be WMV-2. WMV-2 is most prevalent on Saccharine Melon in Xinjiang.

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ORG: MENG, YAO, et al., all of the Beijing Plant Protection Station; SONG  
of the Hai Dian Agricultural Institute, Beijing

TITLE: "A Preliminary Study of the Field Sampling Technique of the Population  
of the Oriental Armyworm *Mythimna separata* (Walker)"

SOURCE: Tianjin ZHIWU BAOHU XUEBAO [ACTA PHYTOPHYLACTICA SINICA] in Chinese No 3,  
Sep 82 pp 173-178

TEXT OF ENGLISH ABSTRACT: Based on the study of the distribution pattern of the  
oriental armyworm population, the sampling technique, theoretical sampling  
numbers and sequential sampling were studied.

1. Comparing the degree of accuracy of several simple random samplings, we con-  
sider the chessboard sampling method to be the best one in the investigation of  
the egg stage, while the parallel-line sampling method can be applied in the  
investigation of the larval and pupal stages.
2. By calculation, the theoretical sampling numbers of the different develop-  
mental stages of the oriental armyworm were defined, and the relation between  
the theoretical sampling number and relative variance was analyzed.

[Continuation of ZHIWU BAOHU XUEBAO No 3, Sep 82 pp 173-178]

3. Using the sequential sampling method, the chemical control standard of the  
oriental armyworm population in the larval stage in the field was tested.  
To analyze the larval quantities by means of sequential sampling, the following  
equations were used:

$$\begin{cases} d_0 = 3.84n - 40.738 \\ d_1 = 3.84n + 40.738 \end{cases}$$

A practical table of determination for field use was made. A calculative character  
curve and average sampling number curve were given.

AUTHOR: None

ORG: Scientific Research Coordinated Group for Planthoppers of Sichuan, Yunnan and Guizhou Provinces

TITLE: "Migration and Occurrence of White-backed Planthoppers and Brown Planthoppers in Southwest China"

SOURCE: Tianjin ZHIWU BAOHU XUEBAO [ACTA PHYTOPHYLACTICA SINICA] in Chinese No 3, Sep 82 pp 179-186

TEXT OF ENGLISH ABSTRACT: In southwest China, migration and occurrence of white-backed planthoppers (*Sogatella furcifera* Horvath) and brown planthoppers (*Nilaparvata lugens* Stal) have different features from those in the eastern part of China as a result of the combined effect of different geographic location, topography, climate, cultural system, etc.

The planthoppers immigrated abundantly into the southeastern part of Guizhou Province at an earlier season, with the white-backed planthoppers being the predominant species. In Yunnan Province, immigration appeared first in the southern part and then in the north, and the predominant species was the brown planthopper, followed by the white-backed planthoppers. In Sichuan Province, immigration appeared first in the eastern part and then in the west. The migratory paths of that generation causing major damage were varied, and the

[Continuation of ZHIWU BAOHU XUEBAO No 3, Sep 82 pp 179-186]

migrations of short and middle distances occurred frequently in the summer. Therefore, there were two major damage periods on middle rice during some years.

As for characteristics of occurrence, in normal years planthoppers usually do more serious damage in the eastern and southern parts of the above three provinces than in the western and northern parts. The nearest planthopper populations were the principle sources of emigration doing harm to middle and late rice. It has been found that the planthopper could be checked by various kinds of natural enemies.

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TITLE: "Influence of Various Food Plants on the Growth and Fecundity of *Agrotis segetum*"

SOURCE: Tianjin ZHIWU BAOHU XUEBAO [ACTA PHYTOPHYLACTICA SINICA] in Chinese No 3, Sep 82 pp 187-192

TEXT OF ENGLISH ABSTRACT: Various food plants were tested with the larvae and moths of *Agrotis segetum* (Schiff.) to see their influence on the number of eggs laid. The results show that when larvae fed on leaves of Chinese cabbage, cotton, and corn, along with some wild herbs, the moths emerging laid more eggs and lived longer than did those emerging from the larvae fed on other plants. The larval stage of those fed on *Chenopodium* spp. was much shorter than that of those fed on *Abutilon* spp., and the percentage of mortality was also lower. Moreover, body weights of the pupae whose larvae fed on Chinese cabbage or *Chenopodium* were heavier than those from larvae which fed on potato.

[Continuation of ZHIWU BAOHU XUEBAO No 3, Sep 82 pp 187-192]

Results showed that the moths laid more eggs (1.99 ~ 14.06 times) when feeding on honey and sugar or nectar of *Aster* or *Helianthus* flowers than did those living on Chinese cabbage or alfalfa flowers or water alone.

It seems that supplementary diet taken at the adult stage has a more important effect on fecundity than the quality of foodstuff taken at the larval stage.

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TITLE: "Bioassay of the Nuclear Polyhedrosis Virus of the Cotton Bollworm,  
*Heliothis armigera*"

SOURCE: Tianjin ZHIWU BAOHU XUEBAO [ACTA PHYTOPHYLACTICA SINICA] in Chinese No 3,  
Sep 82 pp 193-197

TEXT OF ENGLISH ABSTRACT: Bioassay of the isolated S01-43 nuclear polyhedrosis virus (SEV) was conducted on early third-instar larvae of *H. armigera* which were individually reared on an artificial diet contaminated with the virus. The regression equation between dosage and mortality was  $y = 3.3387 + 0.484x$ . The LD<sub>50</sub> value and 95 percent fiducial limits were 2707 PIB and 1134 ~ 6455 PIB/g of diet, respectively. The LT<sub>50</sub> values for  $5 \times 10^4$  and  $5 \times 10^5$  PIB/g of diet were 7.36 and 6.27 days, respectively. S01-43 NPV stored for 3 years in a refrigerator (4°C) lost 79.03 percent of its LD<sub>50</sub> activity, but that stored for 3 years at room temperature (approximately 22°C on the average) lost 91.21 percent of its LD<sub>50</sub> activity.

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TITLE: "The Geographical Distribution and Control of Millet Borer, *Chilo infuscatella* (Snellen), in Luliang Mountainous Region"

SOURCE: Tianjin ZHIWU BAOHU XUEBAO [ACTA PHYTOPHYLACTICA SINICA] in Chinese No 3,  
Sep 82 pp 198-203

TEXT OF ENGLISH ABSTRACT: The altitude of the Luliang mountainous region ranges from 700 to more than 1400 m. It was found that damage done to the millet by the millet borer, *Chilo infuscatella*, changed with the altitude, being severest in the range from 1100 to 1300 m. Above 1500 m, no incidence was observed.

There was only one generation of the borer annually. Winter was passed almost exclusively in the millet stubble as mature larvae in cocoons. If June was dry, the overwintering larvae could not readily pupate and incidence was less severe. When the precipitation reached 20 mm by mid-June (which was quite unusual), the larvae could pupate promptly and injury to millet would be severe that very year.

Based on the estimated loss and economic threshold, it would not be difficult to decide if a millet field needed chemical control.

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TITLE: "A Preliminary Study on the Resistance to Insecticides of Brown  
Planthopper (*Nilaparvata lugens* Stal)"

SOURCE: Tianjin ZHIWU BAOHU XUEBAO [ACTA PHYTOPHYLACTICA SINICA] in Chinese No 3,  
Sep 82 pp 205-210

TEXT OF ENGLISH ABSTRACT: A survey on the susceptibility of the brown planthopper  
collected from different areas of Zhejiang Province to  $\gamma$ BHC, malathion and  
parathion was tested by topical application in 1977. The data obtained showed  
that resistance of the brown planthopper to  $\gamma$ BHC and malathion appearing in paddy  
rice fields between June and early July in the areas of this province was 2.4 ~  
6.8 and 3 times respectively in comparison with that of Wucun Juxian County. The  
autumnal generation was 4.7-fold resistant to  $\gamma$ BHC as compared with LD<sub>50</sub> of the  
immigrant summer generation. The resistant laboratory strain originating from  
the autumnal generation in Dongyang County was 11.5 times resistant to  $\gamma$ BHC as

[Continuation of ZHIWU BAOHU XUEBAO No 3, Sep 82 pp 205-210]

compared with the susceptible strain from the immigrant summer generation in  
Wucun Juxian County. It was found that the susceptibility of the above-mentioned  
strain ( $\gamma$ BHC-resistant strain) to organophosphates, such as malathion, parathion  
and sumithion, was the same as that of the susceptible strain.

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TITLE: "Studies of a New Insecticide--Thiocyclam Hydrogen Oxalate--for the Control of Rice Insects"

SOURCE: Tianjin ZHIWU BAOHU XUEBAO [ACTA PHYTOPHYLACTICA SINICA] in Chinese No 3, Sep 82 pp 211-216

TEXT OF ENGLISH ABSTRACT: Based on the results of three years of laboratory and field experiments, it was found that thiocyclam hydrogen oxalate is very effective against the rice striped borer (*Chilo suppressalis*), the yellow stem borer (*Tryporyza incertulas*), the rice leaf folder (*Chaphalocrocis medinalis*) and the

[Continuation of ZHIWU BAOHU XUEBAO No 3, Sep 82 pp 211-216]

rice thrip (*Baliothrips biformis*). The characteristics, effectiveness and mode of action of thiocyclam hydrogen oxalate are discussed. Results of root-zone application showed that thiocyclam hydrogen oxalate is also a good systemic insecticide when used at a rate of 1.5 kg ai/ha. It is very effective in controlling rice borers and thrips by root-zone application.

In view of the fact that thiocyclam hydrogen oxalate belongs to a novel class of insecticides, including cartap and "diemhypo," which presumably acts by the interruption of the nerve impulse transmission at the synapses by blocking the acetylcholine receptors, it is a promising compound for the control of rice insects resistant to organochlorine, organophosphorus and caroamate insecticides.

9717

CSO: 5400/4108

Veterinary Experiments

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TITLE: "The Feeding Effect of Barley Bud Meal on Pig Growth"

SOURCE: Tianjin ZHONGGUO XUMU ZAZHI [CHINESE JOURNAL OF ANIMAL SCIENCE] in Chinese No 5, 5 Oct 82 p 10

ABSTRACT: Barley of a high sprouting rate is selected for 8 hours of soaking (longer in the winter, shorter in the summer) before piling up under a layer of straw cover to allow the sprout to grow to about 1 cun in length. The barley grains that have failed to sprout are eliminated. The sprouts are dried in the sun and ground into a meal. Four experiments were carried out in 1979 to feed the sprout meal to pigs to study its effect on their growth and digestion. Results of the experiment indicate that when 3-5 percent sprout meal is added to the feed of sickly [not robust] pigs and pigs that have been weaned too early, the nutritional conversion rate is obviously improved, some feed may be saved, and the daily weight gain is higher. Adding the barley sprout meal to the feed of grown and healthy pigs, there is no effect, however. Detailed data of the experiment are reported.

6248

CSO: 4011/21



AUTHOR: SHA Zhenggui [3097 1767 6311]  
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TITLE: "Major Characteristic Expressions and Pedigree Analysis of Several Wheat Varieties"

SOURCE: Fuzhou FUJIAN NONGYE KEJI [FUJIAN AGRICULTURAL SCIENCE AND TECHNOLOGY]  
in Chinese No 5, 10 Oct 82 pp 1-5

ABSTRACT: Once the goal of breeding is decided upon, the key to success or failure is the choice of parents. In order to provide the experience regarding the choice of parents, the authors proceeded to study 5 wheat breeds, which were bred out in Fujian and have been extended over large areas, in terms of their major characteristics and their pedigrees, hoping to contribute to the understanding of the evolutionary history, the blood relationship, and the genetic principle or dynamics of major economic characteristics of each of these cultivars. The wheat breeds thus analyzed include Fumai No 7, Hongmangmai, Jinmai 2148, Pumai No 1, and Longqi 35. The genealogical table of each breed is provided and the genealogical origin of each of its major merits and demerits explained.

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TITLE: "New Breeds of Wheat: Fufan-16 and Fufan-17"

SOURCE: Fuzhou FUJIAN NONGYE KEJI [FUJIAN AGRICULTURAL SCIENCE AND TECHNOLOGY]  
in Chinese No 5, 10 Oct 82 pp 6-7

ABSTRACT: Fufan-16 and Fufan-17 were bred out by the Wheat Office using Jinmai-2148 and an Institute's own material B-5 (white) as parents. Offsprings of these 2 sister hybrids were cultivated, identified, and selected for 8 seasons in 5 years in Heilongjiang and several areas of Fujian and their  $F_6$  were found to have stable characteristics and good yielding and adversity resistance in the summer of 1976. In the following winter, their  $F_7$  were propagated in Fumei Brigade of Longhai County, Fujian for preliminary yield test and the yield was computed at above 400 jin/mu. They began to participate in joint regional cultivation experiments of Fujian and 3 South China Provinces in the winter of 1977. The morphological characteristics, yielding, suitable cultivation areas, and essential cultivation techniques are introduced. Their yield is comparable with that of Jinmai-2148 but they mature 3-8 days earlier.

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TITLE: "Low Temperature Cold Damage to Wheat in the Spring and Its Protective Measures"

SOURCE: Fuzhou FUJIAN NONGYE KEJI [FUJIAN AGRICULTURAL SCIENCE AND TECHNOLOGY] in Chinese No 5, 10 Oct 82 pp 7-10

ABSTRACT: Majority of wheat cultivars used in the winter wheat regions of South China belong to the spring type, having relatively poor cold tolerance. These regions are frequently attacked by cold air from the north in late winter and early spring, however, and the wheat crop often suffers from various degrees of low temperature damage to become infertile. From 1980 to 1982, 126 spring type wheat cultivars (lines) of different origins were observed in each spring under natural low temperature condition at various seeding times. Major symptoms of spring low temperature damage and major factors influencing the extent of the damage thus observed are described. The paper suggests the following preventive measures: (1) Reasonable arrangement and selection of cold resistant (tolerant) breeds; (2) Reasonable adjustment of seeding time; (3) Improving fertilizer application and field management to reinforce cold resistance of the wheat; (4) If cold damage should occur, proper application of supplementary fertilizer and water may promote fast growth of undamaged tillers to salvage the crop; (5) Fumigation to protect wheat from frost.

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TITLE: "Wheat High Yield Experience of Wutang of Putian"

SOURCE: Fuzhou FUJIAN NONGYE KEJI [FUJIAN AGRICULTURAL SCIENCE AND TECHNOLOGY] in Chinese No 5, 10 Oct 82 pp 11 13

ABSTRACT: The spring wheat harvest of Wutang Commune's 6,038 mu in 1982 averaged 397 jin/mu. Compared with the previous year, the acreage was 338 mu larger and the yield increased 21.7 percent per mu to result a total production increase of 29.0 percent. Objectively speaking, first, there was the good weather, but due to rainfall deficiency in the early period, wheat seedlings did appear to stop growing. The weather was indeed favorable in the middle and late periods. In view of technical measures, the following experience is summarized: (1) Reasonable arrangement of winter crops including such spring harvested green manure crops of 3201 mu of broad beans and rape; (2) Selecting superior breeds of wheat; (3) Early seeding at a suitable time; (4) Reasonable density; (5) Scientific application of fertilizer; (6) Intensive field management; (7) Preventing lodging, diseases, and pests and having old people and children or straw-man drive birds from wheat fields. These measures are explained in some detail.

AUTHOR: RUSSELLE, M. P. et al

ORG: None

TITLE: "Effect of Soil Temperature on Sprouting in Winter Wheat and Winter Barley Fields"

SOURCE: Fuzhou FUJIAN NONGYE KEJI [FUJIAN AGRICULTURAL SCIENCE AND TECHNOLOGY]  
in Chinese No 5, 10 Oct 82 pp 36-38, 13

ABSTRACT: This paper, originally appearing in AGRONOMY JOURNAL Vol 72 No 5, 1980 pp 823-827, is translated into Chinese by PO Shi [3789 4258].

AUTHOR: SHEN Qinlin [3088 2953 7207]

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TITLE: "Technique of Testing the Soil, Determining the Desired Yield, for Designing a Fertilizer Application Scheme"

SOURCE: Fuzhou FUJIAN NONGYE KEJI [FUJIAN AGRICULTURAL SCIENCE AND TECHNOLOGY]  
in Chinese No 5, 10 Oct 82 pp 49-50

ABSTRACT: Research studies in Fujian and other provinces and experimental results in Shunchang, Pucheng, and Guangze counties of Jianyang Prefecture demonstrate that survey and chemical analysis data of soil may be used to design a fertilizer application scheme to produce a targeted yield increase. In 1981, soils were analyzed in Guangze County before a fertilizer plan was devised accordingly; compared with 1980 when the ordinary fertilizer application method was used, the yield was 81.5 jin/mu higher while the cost of fertilizer was 2.38 yuan/mu lower. A method is introduced to compute the basic fertility of soil on the basis of its chemical analysis data of alkaline decomposed nitrogen, fast acting phosphorus, and fast acting potassium. With a predetermined goal of yield of a given crop, the needs for N, P, and K are calculated and on the basis of the needs and the available supplies of the soil, a fertilizer application scheme is devised. Equations required for these mathematical calculations and the processes of computation are introduced.

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CSO: 4011/22

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